

COUNTY NOTICES PURSUANT TO A.R.S. § 49-112

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NOTICE OF FINAL RULEMAKING PURSUANT TO A.R.S. § 49-471.01 ET SEQ.

PINAL COUNTY

[M09-232]

I. Preamble

The notice of proposed rulemaking for these rule revisions, including a preamble, was published at 15 A.A.R. 653 (4/17/09). Among other things, that preamble included a BACM analysis and the control officer's finding supporting the utilization of an expedited rulemaking process as required by A.R.S. §49-471.08.

On June 3, 2009, the Pinal County Board of Supervisors approved Resolution No. 060309-AQ1, which adopted without revision the rules as proposed in the referenced Register notice.

A.R.S. §49-471.08(E) also requires post-adoption publication in the Register of a notice in the Register. With one clarification, the underlying preamble is unchanged and is therefore incorporated by reference here. The single clarification pertains to the effective date, in that the original preamble indicated that the changes would become effective upon adoption, but the actual text of several of the rules actually specifies an effective date of 60 days after publication of this notice in the *Register*. Subsection E also requires publication of a copy of the control officer's finding, as well as the full text of the final rule. Copies of both follow.

II. Expedited Rulemaking; Control Officer's Finding (ARS §49-471.08.A.2)

The EPA has disapproved Pinal County's rules for failure to establish PM₁₀ BACM for T1N R8E. As a result of extensive discussion with the EPA, Pinal County has formulated this rulemaking to respond to the EPA's disapproval.

The EPA has concurred in the form and substance of Pinal's rulemaking, and has confirmed that the adopted revisions amount to "a conforming change to directly reflect federal or state rule or law' within the meaning of A.R.S. 49-471.08." See March 26, 2009 letter from Colleen McKaughan, Associate Director, Air Division, U.S. EPA Region IX, to Donald Gabrielson, Control Officer, Pinal County Air Quality. For reference, a copy of the EPA's March 26 letter is available under the Air Quality link on the County's web site, www.pinalcountyaz.gov.

Based on the EPA's affirmation, and with full appreciation of the consequence of failing to respond to the EPA's disapproval in a timely manner, Donald Gabrielson, Pinal County Air Quality Control Officer, finds that the rule revisions presented in this Notice are necessary to meet the County's obligations under federal law, and the adopted rules do not alter the sense, meaning or effect of the federal or state law from which this rulemaking is derived.

III. The full text of the adopted changes follows:

1-1-105. SIP list (Amended)

A. As a declaration of Board policy rather than a rule, and subject to the limitations of paragraphs B. and C. of this section, the Board of Supervisors expressly designates the following list of sections within this Code, to be presented to the Governor of Arizona for transmittal to the Administrator of the EPA with a request that they be included as elements in the Arizona SIP:

1. Chapter 1
 - a. Article 1. (As amended 5/14/97 and 5/27/98), except for §§1-1-105 and 1-1-107.
 - b. Article 2 (As amended 5/14/97 and 7/12/00) except for §1-2-110.
 - c. Article 3. (As amended 5/14/97, 5/27/98 and 10/27/04, except for §1-3-130 and the definition in §1-3-140.82 (10/12/95) of "maximum achievable control technology.")
2. Chapter 2
 - a. Article 1. (As amended 10/12/95).
 - b. Article 2. (As amended 5/14/97).
 - c. Article 3. (As amended 10/12/95).
 - d. Article 4. (As amended 10/12/95).
 - e. Article 5. (As amended 10/12/95).
 - f. Article 6. (As amended 10/12/95).
 - g. Article 7. (As amended 10/12/95).
 - h. Article 8. (As amended 5/18/05, as amended 1/7/09).
3. Chapter 3
 - a. Article 1. (As amended 5/14/97, and 5/27/98 and 7/12/00), excluding:
 - i. §3-1-020
 - ii. §3-1-045

- iii. §3-1-080
- iv. §3-1-100
- b. Article 2. (As amended 10/12/95, 5/27/98 and 7/29/98).
- c. Article 3. (As amended 10/12/95).
- d. Article 8. (As amended 10/12/95 and 10/27/04).
- 4. Chapter 4
 - a. Article 1. (As amended 2/22/95).
 - b. Article 2. (As amended 5/14/97, 7/12/00, 12/4/02 and 10/27/04).
 - c. Reserved.
 - d. Article 4 (As amended 6/3/09).
 - e. Article 5 (As amended 6/3/09).
 - f. Reserved.
 - g. Article 7 (As amended 6/3/09)
 - h. Reserved.
 - i. Article 9, limited to:
 - i. §4-9-320 (As amended 6/3/09)
 - ii. §4-9-340 (As amended 6/3/09)
- B. Notwithstanding the approval as elements of the SIP of those provisions of the Code identified in paragraph A of this section, those provisions, save §3-1-084 which shall be expressly exempted from the limitation of this paragraph, shall operate as elements of the SIP only insofar as they pertain to:
"construction," as defined in Nov. '93 Code §1-3-140.28; or
"modification," as defined in Nov. '93 Code §1-3-140.85; and
- C. Notwithstanding the approval as elements of the SIP of those provisions of the Code identified in paragraph A of this section, neither those provisions nor any permit conditions imposed pursuant to those provisions shall:
 - 1. Operate as elements of the SIP insofar as they pertain to other than "conventional pollutants," as defined in §1-3-140.33;
 - 2. Operate as elements of the SIP insofar as they pertain only to a requirement arising under, or pertain to a source subject to regulation exclusively by virtue of a requirement arising under:
 - a. §111 of the Clean Air Act; or
 - b. Title IV of the 1990 amendments to the Clean Air Act; or
 - c. Title VI of the 1990 amendments to the Clean Air Act; or
 - d. Any section of this Code that is not a part of the SIP;
 - 3. Operate as an element of the SIP, at least insofar as they impose a "fee";
 - 2. Operate as an element of the SIP, at least insofar as they require a "certification";
 - 3. Operate as an element of the SIP, at least insofar as they impose obligations pertaining to "renewals";
 - 6. Operate as an element of the SIP, at least insofar as they impose requirements regarding "excess emissions"; or
 - 7. Operate as an element of the SIP, at least insofar as they impose requirements regarding "compliance plans."
- D. As a renumbering and reconciliation of previously approved SIP provisions as elements of this Code, the Board of Supervisors additionally designates the following list of sections within this Code, to be presented to the Governor of Arizona for transmittal to the Administrator of the EPA with a request that they be included as elements in the Arizona SIP without operational limitation:
 - 1. §1-1-010.C (2/22/95) and 1-1-010.D (2/22/95) Declaration of Policy
 - 2. Chapter 2, Article 8 (As amended 5/14/97) Visibility Limiting Standard
 - 3. Chapter 3, Article 8 (2/22/95) Open Burning
 - 4. [Reserved]
 - 5. [Reserved]
 - 6. [Reserved]
 - 7. [Reserved]
 - 8. [Reserved]
 - 9. [Reserved]
 - 10. [Reserved]
 - 11. [Reserved]
 - 12. §5-18-740 (2/22/95) Storage of Organic Compounds Organic Compound Emissions
 - 13. §5-19-800 (2/22/95) Loading of Volatile Organic Compounds Organic Compound Emissions
 - 14. §5-21-920 (2/22/95) Fossil Fuel Fired Industrial and Commercial Equipment Standard Applicability
 - 15. §5-21-930 (2/22/95 and 7/12/00) Fossil Fuel Fired Industrial and Commercial Equipment Particulate Emission Standard
 - 16. §5-22-950 (2/22/95) Fossil Fuel Fired Steam Generator Standard Applicability
 - 17. §5-22-960 (2/22/95) Fossil Fuel Fired Steam Generator Sulfur Dioxide Emission Limitation
 - 18. §5-24-1030.F (2/22/95) Generally Applicable Federally Enforceable Minimum Standard of Performance Organic Compound Emissions
 - 19. §5-24-1030.I (2/22/95) Generally Applicable Federally Enforceable Minimum Standard of Performance Carbon Monoxide

Arizona Administrative Register / Secretary of State

County Notices Pursuant to A.R.S. § 49-112

- 20. §5-24-1032 (2/22/95) Federally Enforceable Minimum Standard of Performance Process Particulate Emissions
- 21. §5-24-1040 (2/22/95) Carbon Monoxide Emissions Industrial Processes
- 22. §5-24-1045 (2/22/95) Sulfite Pulp Mills Sulfur Compound Emissions
- 23. §5-24-1050 (2/22/95, as amended June 20, 1996) Reduced Sulfur Emissions Default Limitation
- 24. §5-24-1055 (2/22/95) Pumps and Compressors Organic Compound Emissions

ARTICLE 4. PM-10 NONATTAINMENT AREA RULES; DUSTPROOFING AND STABILIZATION FOR COMMERCIAL UNPAVED PARKING, DRIVES AND WORKING YARDS

~~4-4-100. Dustproofing for Commercial Parking, Drives and Yards; Applicability~~ [Existing rule rescinded]

~~A. Geographic Applicability:~~

~~The "affected area" under this rule includes the Pinal County portion of the Phoenix Planning Area Serious PM10 nonattainment Area, identified as Township 1 North, Range 8 East, Gila & Salt River Base and Meridian.~~

~~B. Affected Parcels; Commercial Property:~~

~~Property subject to this rule:~~

- ~~1. Includes any parcel, contiguous parcels, or any proximate combination of parcels actually used for commercial purposes, including retail, office, meeting, governmental, industrial, service business or commercial storage purposes;~~
- ~~2. Includes any single deeded or platted parcel having built thereon a residential building or buildings with five or more residential units;~~
- ~~3. Includes any common parking area at an otherwise affected parcel; and~~
- ~~4. Excludes any right-of-way legally established and actually maintained for travel by the public or to provide vehicular access to public utilities.~~
- ~~5. Excludes earthmoving activity at a site, or that portion of a site, covered by mitigation requirements under dust registration issued by the Pinal County Control Officer.~~

~~C. Affected surfaces at a commercial property:~~

- ~~1. Affected surfaces include any areas utilized on a regular basis for parking, maneuvering or ingress and egress of on- or off road vehicles. Access lanes and working surfaces for vehicles shall qualify as affected surfaces.~~
- ~~2. Undisturbed surfaces are not affected surfaces, but only if those undisturbed surfaces are fenced or otherwise clearly distinguished from affected surfaces. Delineated long term storage stalls, where a vehicle, trailer or other item is stored and not normally removed and replaced more than once in a sixty day period shall also be considered undisturbed surfaces.~~

[Adopted effective September 10, 2008.]

4-4-100. General Provisions [New Replacement Section]

- A. Intent. The intent of this Article is to avoid violations of the prevailing PM₁₀ standard and additionally minimize nuisance impacts by improving control of excessive fugitive dust emissions from unpaved parking lots.
- B. Relationship to other rules. The provisions of this Article supplement and do not supplant the other provisions of these rules.
- C. Effective Date. Other than as specifically provided, rules set forth in this Article, and the repeal of any rules rescinded in conjunction with the amendment of this Article, shall become effective 60 days after final publication of a corresponding Notice of Final Rulemaking in the Arizona Administrative Register.
- D. Geographic Applicability
This Article applies in the Pinal County portion of the Phoenix PM₁₀ Serious Nonattainment area, more specifically Township 1 North, Range 8 East, Gila & Salt River Base and Meridian ("T1N R8E").
- E. Violations
Failure by any person to comply with the applicable requirements of this Article shall constitute a violation subject to penalty as provided in these rules and A.R.S. Title 49, Chapter 3, Article 3, A.R.S. §49-471 et seq.

~~4-4-110. Control Requirement~~ [Existing Rule Rescinded]

~~A. On and after the effective date, the owner and/or operator of any commercial property shall install and maintain permanent dustproof surfacing for all affected surfaces. For purposes of this rule, "owner or operator" means any person who owns, leases, operates, controls, or supervises an affected area.~~

~~B. For purposes of this rule, permanent dustproofing shall consist of one of the following, implemented in a manner that meets the maintenance standard of this rule:~~

- ~~1. Paving with asphaltic concrete;~~
- ~~2. Paving with Portland cement based concrete;~~
- ~~3. Surfacing with a penetrating asphalt and a gravel surface, commonly known as chip sealing;~~
- ~~4. Surfacing with and uniformly maintaining a two-inch deep layer of rock having a nominal size of 1/4" or larger;~~
- ~~5. Surfacing with a two-inch deep layer of recycled asphalt; or~~
- ~~6. Surfacing with any other surface treatment that has been approved in writing by the Pinal County Control Officer.~~

~~C. Maintenance~~

~~Permanent dustproofing shall be maintained in a manner that prevents visible track-out.~~
[Adopted effective September 10, 2008.]

4-4-110 Definitions [New Replacement Section]

As used in this Article:

- A. Hierarchy of definitions
For purposes of this Article definitions shall be based on the following order of precedence:
 - 1. Enumerated definitions under this rule;
 - 2. Definitions in §4-7-210;
 - 3. Definitions set forth elsewhere in these rules; and
 - 4. The common and ordinary meaning of the term.
- B. Lot - A parcel of land identified on a final or parcel map recorded in the office of the Pinal County recorder with a separate and distinct number or letter.
- C. Low use unpaved parking lot - A lot on which vehicles are parked no more than thirty-five (35) days during a calendar year.
- D. Motor vehicle - A self-propelled vehicle for use on the public roads and highways of the State of Arizona and required to be registered under the Arizona State Uniform Motor Vehicle Act, including any non-motorized attachments, such as, but not limited to, trailers or other conveyances which are connected to or propelled by the actual motorized portion of the vehicle.
- E. Owner and/or operator - Any person who owns, leases, operates, controls, maintains or supervises an unpaved parking lot surface subject to the requirements of this Article.
- F. Pavement - A traffic-bearing surface consisting of any of:
 - 1. asphalt,
 - 2. recycled asphalt,
 - 3. concrete,
 - 4. Penetration treatment of bituminous material and a seal coat of bituminous binder and mineral aggregate, commonly known as "double chip seal" or "asphalt rock dust palliative" ("ARDP"),
 - 5. asphaltic concrete,
 - 6. rubberized asphalt, or
 - 7. other similar material.
- G. Property line - The boundaries of an area in which either a person causing the emission or a person allowing the emission has the legal use or possession of the property. Where such property is divided into one or more sub-tenancies, the property line(s) shall refer to the boundaries dividing the areas of all sub-tenancies.
- H. Unpaved commercial parking lot - Any area that is not paved and that is used for parking, maneuvering, material handling, or storing motor vehicles and equipment. An unpaved commercial parking lot includes, but is not limited to, automobile impound yards, wrecking yards, automobile dismantling yards, salvage yards, material handling yards, and storage yards. For the purpose of this definition, maneuvering shall not include military maneuvers or exercises conducted on federal facilities. For purposes of Article 4, an unpaved commercial parking lot does not include parking, maneuvering, ingress and egress areas at residential buildings with four or fewer units, which residential parking lots separately regulated under Article 5.

~~4-4-120. Deferred enforcement date~~ [Existing Rule Rescinded]

~~The Control Officer shall commence enforcement of the requirements of this Article no sooner than October 1, 2008.~~
[Adopted effective September 10, 2008.]

4-4-120. Objective Standards [New Replacement Section]

An Owner and/or Operator shall stabilize any affected unpaved commercial parking lot surface such that:

- A. [Silt Content/Silt Loading Limitations] Every unpaved commercial parking lot shall show compliance at all times with one of the following objective standards as assessed in accord with Article 9, §4-9-320.A:
 - 1. Silt loading shall not exceed 0.33 oz/ft²; or
 - 2. Silt content shall not exceed 8% for parking areas.
- B. [Opacity Limitations] Observed opacity shall not exceed either:
 - 1. 20% Internal Opacity Limitation. For any fugitive dust plume caused by vehicular movement, a limit of 20 percent opacity based on an intermittent opacity method, as determined by the applicable test method of Article 9. See §4-9-340.D.; or
 - 2. 0% Property Line Wind-Driven Opacity Limitation. The net opacity contribution from any unpaved commercial parking lot shall not violate a 0% opacity standard beyond the property line within which the emissions are generated for more than 30 seconds in any continuous six-minute period. For purposes of this limitation, opacity shall be determined based on a time-aggregation method. See Article 9, §4-9-340.F.

4-4-130. Work Practice Standards [New]

- A. Commercial Unpaved Parking Lots
At any unpaved commercial parking lot other than a low-use unpaved commercial parking lot, the Owner and/or Operator shall:
 - 1. Restrict vehicle access to only those areas for which control measures have been taken.

2. Dustproof the unpaved commercial parking lot with one of the following control measures:
 - a. Pave;
 - b. [Gravel surfacing] Uniformly apply and maintain surface gravel; or
 - c. [Dust suppressants & trackout control] Apply dust suppressants other than water and install, maintain, and use a suitable trackout control system that controls and prevents trackout and/or removes particulate matter from the tires and the exterior surfaces of motor vehicles that traverse the site.
 3. Make a record of the dustproofing action taken.
- B. Low-Use Unpaved Commercial Parking Lots
At any low-use unpaved commercial parking lot, the Owner and/or Operator shall:
1. Restrict vehicle access to only those areas for which control measures have been taken.
 2. Dustproof the unpaved commercial parking lot with one of the following measures:
 - a. Pave;
 - b. [Gravel surfacing] Uniformly apply and maintain surface gravel;
 - c. [Dust suppressants & trackout control] Apply dust suppressants other than water and install, maintain, and use a suitable trackout control system that controls and prevents trackout and/or removes particulate matter from the tires and the exterior surfaces of motor vehicles that traverse the site; or
 - d. [Water & trackout control] Apply water and install, maintain, and use a suitable trackout control device that controls and prevents trackout and/or removes particulate matter from the tires and the exterior surfaces of motor vehicles that traverse the site.
 3. Make a record of the dustproofing action taken.
- C. Compliance Determination
Implementation of the work practice standards required under this section shall be deemed inadequate until the Owner and/or Operator achieves compliance with the objective standards of §4-4-120.
- D. Trackout Cleanup Requirement
If trackout occurs, the Owner and/or Operator shall:
1. Repair and/or replace the control measure(s);
 2. Clean-up immediately such trackout from paved areas accessible to the public including curbs, gutters, and sidewalks when trackout exceeds a cumulative distance of 25 lineal feet;
 3. Clean-up all visible trackout from paved areas accessible to the public at the end of the day.
 4. Make a record of the repair, replacement and/or cleanup action taken.
- 4-4-140. Recordkeeping and Records Retention [New]
- A. Requirement to furnish records upon request. Upon verbal or written request by the Control Officer, the log or the records and supporting documentation required under this Article shall be provided as soon as possible but no later than 48 hours, excluding weekends. If the Control Officer is at the Site where requested records are kept, records shall be provided without delay.
 - B. Records Retention. Any person subject to a record-keeping requirement shall retain copies of approved control measure implementation records, and all supporting documentation for at least two years from the date such records were initiated.

ARTICLE 5. NONATTAINMENT AREA RULES; STABILIZATION FOR RESIDENTIAL
PARKING AND DRIVES [EXISTING]

- 4-5-150. Stabilization for Residential Parking and Drives; Applicability [Existing]
- A. Geographic Applicability.
The "affected area" under this rule includes the Pinal-County-portion of the Phoenix Planning Area Serious PM₁₀ nonattainment Area, identified as Township 1 North, Range 8 East, Gila & Salt River Base and Meridian.
 - B. Affected Parcels; Residential Property.
Property subject to this rule:
 1. Includes any parcel, contiguous parcels, or any proximate combination of parcels actually used coordinated fashion and having four or fewer residential rental units;
 2. Includes any common parking area at an otherwise affected parcel;
 3. Excludes any right-of-way legally established and actually maintained for travel by the public or to provide vehicular access to public utilities; and
 4. Excludes earthmoving activity at a site, or that portion of a site, covered by mitigation requirements under dust registration issued by the Pinal County Control Officer.
 - C. Affected Surfaces at a Residential Property.
 1. Affected surfaces include any areas in excess of 3,000 square feet utilized on a regular basis for parking, maneuvering or ingress and egress of on- or off-road vehicles.
 2. Undisturbed surfaces are not affected surfaces, but only if those undisturbed surfaces are fenced or otherwise clearly distinguished from affected surfaces. Delineated long-term storage stalls, where a vehicle, trailer or other item is stored and not normally removed and replaced more than once in a sixty-day period shall also be considered undisturbed surfaces.

4-5-160. Residential Parking Control Requirement [Amended]

- A. On and after the effective date, the owner and/or operator of any residential property shall install and maintain stabilized surfacing for all affected surfaces. For purposes of this rule, "owner or operator" means any person who owns, leases, operates, controls, or supervises an affected area.
- B. For purposes of this rule, a stabilized surface shall consist of one of the following, implemented in a manner that meets the maintenance standard of this rule:
1. Paving with asphaltic concrete;
 2. Paving with Portland cement based concrete;
 3. Surfacing with a penetrating asphalt and a gravel surface, commonly known as chip sealing;
 4. Surfacing with and uniformly maintaining a two-inch deep layer of rock having a nominal size of 1/4" or larger;
 5. Surfacing with a two-inch deep layer of recycled asphalt;
 6. Watering with sufficient frequency so as to maintain a crust on the surface;
 7. Surfacing with any other surface treatment that has been approved by the Pinal County Control Officer; or
 8. Initially, and at such other times as may be requested by the Control Officer, demonstrating to the satisfaction of the Pinal County Control Officer on a form as required by the Control Officer and pursuant to a test method approved by the Control Officer, that the average threshold friction velocity of the native soil surface, corrected for non-erodible elements, is at least 100 cm/second. Threshold friction velocity shall be assessed in accord with ~~§4-9-300~~ §4-9-320.B.2.
- C. Maintenance
Surface stabilization shall be maintained in a manner that ~~both:~~
- ~~1- Prevents prevents~~ visible track-out in excess of ten feet in length; ~~and~~
 - ~~2- Meets the performance standards of Code §4-2-040.A and .B, requiring reasonable precautions to effectively prevent vehicle-generated dust from becoming airborne.~~

4-5-170. Deferred enforcement date [Existing]

The Control Officer shall commence enforcement of the requirements of this Article no sooner than October 1, 2009.

ARTICLE 7. CONSTRUCTION SITES IN NONATTAINMENT AREAS - FUGITIVE DUST [NEW]

4-7-210. Definitions [New]

As used in this Article:

1. "Aggregate area" means, for purposes of assessing either disturbed area or overall project size, the relevant area or areas under common control and contained within a planned area development, within a legal subdivision, and/or adjoining parcels undergoing concurrent Development Activity. Parcels shall be considered adjoining if they are either contiguous or separated only by a privately or publicly owned easement or right-of-way.
2. "Bulk material" as used in this rule, means any material including but not limited to earth, rock, silt, sediment, sand, gravel, soil, fill, aggregate less than 2 inches in length or diameter, dirt, mud, grubbed materials, cinders, pumice, demolition debris, and dry concrete, which are capable of producing fugitive dust at an industrial, institutional, commercial, governmental, construction and/or demolition site.
3. "Construction" means building, maintaining or modifying a capital improvement resting upon, connected to or buried in the earth. Construction includes, but is not limited to, building construction, installing underground utilities, installing above-ground utilities, and building physical infrastructure including roads, highways, railways, flood structures, drainage works and irrigation works. Notwithstanding any other exemption under these rules, weed abatement by discing or blading and conducted for the purpose of enabling Development Activity or maintaining a Site shall qualify as construction.
4. "Development Activity" or "Development Activities" are defined as follows:
 - A. Development Activity includes:
 1. Earthmoving;
 2. Construction;
 3. When conducted on a Site, any of:
 - a. Use of vehicles or self-propelled equipment for material handling or storage off of a dustproof paved surface;
 - b. Use of vehicles or self-propelled equipment for transporting materials or personnel off of a dustproof paved surface;
 - c. Parking a vehicle or self-propelled equipment off of a dustproof paved surface;
 4. Generating trackout as a result of any other Development Activity.
 - B. Notwithstanding subparagraph A., Development Activities shall not include:
 1. Normal farm cultural practices, including leveling of fields.
 2. Permit-regulated non-fugitive emission points and permit-regulated fugitive emission sources at any stationary facility operating under authority of a permit issued pursuant to ARS §§49-426 or 49-480, provided that this Article shall apply to Development Activity not specifically regulated under the permit.
 3. Permit-regulated non-fugitive emission points at a portable source operating on a Site in support of Development Activity otherwise regulated under this Article pursuant to a permit issued pursuant to ARS §§49-426 or 49-480, except to the extent that operation of such portable source is conducted in support of

- Development Activity otherwise regulated under this Article, in which case this Article shall still apply to such a permitted portable source with respect to fugitive emissions from any source-specific Development Activity as defined under this Article.
4. Emergency response activities that may disturb the soil conducted by any utility or government agency in order to prevent public injury or to restore critical utilities to functional status. For purposes of this subsection, an emergency response must address a situation arising from a sudden and unforeseeable event beyond the control of the Owner and/or Operator, including acts of God. Activities by an Owner and/or Operator to address a disturbance resulting from improperly designed equipment, lack of preventative maintenance, careless or improper operation or operator error shall not qualify as an emergency response.
 5. Normal surface maintenance of established roads, established utility easements, established traveled rights-of-way and established access roads does not constitute development, but only if such maintenance is not part of a larger project and:
 - a. Is not within a Site that is otherwise subject to a Site Permit requirement; and
 - b. Such maintenance does not involve cutting, filling or the import or export of material.
 6. Hauling activities outside of a Site, other than as regulated under project-linked trackout provisions of these rules and under §4-7-230.D pertaining to haulage between portions of a Site that straddles a roadway.
 7. Weed abatement by discing or blading, subject to the limitations of §§4-7-210.3 and 4-7-210.7.
5. "Disturbed surface" or "disturbed area" means any portion of the earth's surface, or material placed on the earth's surface, that has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural condition, thereby increasing the potential for emission of fugitive dust.
- A. If a Site contains disturbed surfaces areas exhibiting visibly distinguishable soils, vegetative cover, or other stabilization characteristics, the Owner and/or Operator shall treat each such distinguishable area separately for purposes of assessing the necessary stabilization for that soil type or condition.
 - B. For trenches that are less than four feet in depth, it is assumed that a six (6) foot wide path of surface material will be disturbed as the trench is dug. Once the trench exceeds a length of 726 feet, 0.1 acres of surface area has been disturbed. For trenches that are four feet or greater in depth, it is assumed that a twelve (12) foot wide path of surface material will be disturbed as the trench is dug. Once the trench exceeds a length of 363 feet, 0.1 acres of surface area have been disturbed. If the registrant identifies situations in which the amount of surface area should be calculated differently, a case-by-case determination would be made.
 - C. For calculations of the projected disturbed surface areas that will result from land clearing or earthmoving activities, a minimum of 25 feet will be added to each dimension of all structures, driveways, concrete pads, and other construction projects being built on the Site to allow for an equipment utilization zone.
 - D. Surfaces that have been stabilized to meet at least one of the stabilization standards of §4-7-226.D shall no longer be considered disturbed.
6. "Dust suppressant" means water, hygroscopic material, solution of water and chemical surfactant, foam, non-toxic chemical stabilizer or any other dust palliative, which is not prohibited for ground surface application by the U.S. Environmental Protection Agency (EPA) or the Arizona Department of Environmental Quality (ADEQ) or any applicable law, rule, or regulation, as a treatment material for reducing fugitive dust emissions.
7. "Earthmoving" means use of vehicles or self-propelled equipment for: land stripping; trenching; grading; cutting and filling earthen materials; excavating; land leveling; drilling; back filling; contouring the earth; open stockpiling of bulk materials; loading or unloading bulk material; grubbing foundations or slabs; demolition; or any of the foregoing in connection with landscaping a Site. Blasting operations shall constitute earthmoving. Notwithstanding any other exemption under these rules, weed abatement by discing or blading and conducted for the purpose of enabling other earthmoving activity shall qualify as earthmoving.
8. "End of workday" means the end of a working period that may include one or more work shifts. If working 24 hours a day, the end of a working period shall be considered no later than 8 p.m.
9. "Fugitive dust" as used in this rule, means regulated particulate matter, which is not collected by a capture system, which is entrained in the ambient air, and which is caused from human and/or natural activities, such as but not limited to, movement of soils, vehicles, equipment, blasting, and wind. For the purpose of this rule, fugitive dust does not include particulate matter emitted directly from the exhaust of motor vehicles and other internal combustion engines, from portable brazing, soldering, or welding equipment, and from piledrivers.
10. "Net opacity contribution" means the difference between opacity leaving the Site and opacity entering the Site.
11. "Objective requirements" or "objective standards" mean those standards which either establish a numerical performance standard, or which have a formal compliance assessment method established under this Article. Examples include opacity standards, surface stabilization standards and length and pack-thickness limitations on visible trackout.
12. "Opacity" as used in this rule, means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background. See Article 9 for specific methods for assessing opacity.
13. "Owner and/or Operator" means any person who leases, operates, controls, or supervises a Development Activity subject to any requirements of this Article and includes, but is not limited to, the owner, lessee, developer, responsible official, permit applicant, permit holder, general contractor, prime contractor, supervisor or management company of or for a Development Activity or Site.
14. "PAD" means an approved planned area development approved by a political subdivision pursuant to statutory authority.

15. "Paved public roadway" means either:
 - A. A publicly owned paved roadway, as evidenced by a formal acceptance by the state or a political subdivision of the state of either:
 1. An on-going maintenance obligation for the roadway; or
 2. A title or easement for the roadway; or
 - B. Within a PAD or subdivision, a paved private roadway that is open to travel by the public. Where active construction operations continue within a PAD or subdivision, the permittee may post signs to close selected paved roadways within the still-constructing areas to travel by the public. However, at least one road must furnish required paved access to every parcel within the PAD or subdivision that has received a certificate of occupancy, and every such required paved access road shall constitute a "paved public roadway" notwithstanding any signage to the contrary.
16. "Permit," for purposes of this Article, means a Site Permit.
17. "Permittee" means the person or legal entity who has obtained a Site Permit.
18. "Road Construction" as used in this rule, means the use of any equipment for the paving or new construction of a road surface, street or highway.
19. "Road Maintenance" as used in this rule, means the use of any equipment for the repair and preservation of an old road surface, street or highway.
20. "Silt" means any aggregate material with a particle size less than 75 micrometers in diameter, which passes through a No. 200 Sieve.
21. "Site" means any lot, parcel, easement, or right-of-way where Earthmoving or Construction occurs.
22. "Site Permit" means a permit as defined in §§4-7-234, 4-7-238 and/or 4-7-242.
23. "Source" as used in this Article means the Site which is under common control or ownership, and any fixed or moveable object or surface on such Site which is a potential point of origin of fugitive dust.
24. "Stockpile" as used in this rule, means an open storage pile with an open accumulation of bulk material with a 5% or greater silt content that has a total surface area of 150 square feet or more and that at any one point attains a height of three feet. Silt content shall be assumed to be 5% or greater unless the affected party can show, by: testing in accordance with ASTM method C136-96a; or testing by other equivalent method approved in writing by the Control Officer and the EPA Administrator, that the silt content is less than 5%.
25. "Subdivision" means a platted subdivision.
26. "Suppressant" means dust suppressant.
27. "Trackout" means visible material deposited onto any paved public roadway, as defined in this Article, by traffic leaving a Site.
28. "Unpaved haul/access road" as used in this rule, means any on-site unpaved road used by commercial, industrial, institutional, and/or governmental traffic.
29. "Unpaved road" as used in this rule, means any road or equipment path that is not paved. For the purpose of this rule, an unpaved road is not a horse trail, hiking path, bicycle path, or other similar path used exclusively for purposes other than travel by motor vehicles.
30. "Work practice standards" mean those standards which have neither a numerical performance standard or a compliance assessment method established. Compliance with work practice standards is assessed on a pass/fail basis.

4-7-214. General Provisions [New]

- A. Intent. The intent of this Article is to avoid violations of the prevailing PM₁₀ standard and additionally minimize nuisance impacts by improving control of excessive fugitive dust emissions. The Article focuses on emissions from process activity, site activity and a lack of adequate surface stabilization, all associated with construction, earthwork or land development.
- B. Relationship to other rules. Other than as provided in subsection D below, the provisions of this Article supplement and do not supplant the other provisions of these rules.
- C. Effective Date. The rules set forth in this Article shall become effective 60 days after the publication of a notice of final rulemaking in the Arizona Administrative Register.
- D. Geographic Applicability
This Article applies in the Pinal County portion of the Phoenix PM₁₀ Serious Nonattainment area, more specifically Township 1 North, Range 8 East, Gila & Salt River Base and Meridian ("T1N R8E"). In the affected region, this Article supplants the generally applicable dust registration program of Chapter 4, Article 3 of this Code.
- E. Violations
Failure by any person to comply with the applicable requirements of this Article shall constitute a violation subject to penalty as provided in these rules and A.R.S. Title 49, Chapter 3, Article 3, A.R.S. §49-471 et seq.

4-7-218. Applicability; Development Activity [New]

- A. The objective standards of §4-7-226 and the work practice requirements of §4-7-230 shall apply to Development Activity at any Site, regardless of the size of the disturbed area.
- B. Unless Development Activity qualifies for coverage under an Area Block Permit, the Site Permit requirements of §§4-7-234 and 4-7-238 apply to any Site which includes an aggregate area of more than 0.1 acres that has been or will be disturbed by Development Activity.

- C. The Area Block Permit requirements under §§4-7-234 and 4-7-242 apply to any political subdivisions and Public Utility Corporations which will regularly engage in Development Activity that will disturb an area of 0.1 acres or more.

4-7-222. Owner and/or Operator Liability [New]

- A. Onset. Compliance with the requirements of this Article shall commence on or before the date when Development Activity begins on the Site.
- B. Duration and Termination. Obligations continue until all of the following occur:
1. Development Activity has ceased.
 2. All disturbed portions of the Site have been stabilized as required under §4-7-226.
 3. The Control Officer approves closure of the construction permit.
- C. Obligations. With respect to any Site, an Owner and/or Operator shall:
1. Obtain, or cause to be obtained, and be liable for any failure to obtain, a Permit pursuant to §§4-7-238 or 4-7-242 for any Site with a disturbed area exceeding 0.1 acres.
 2. Until termination as provided in this section, comply with or cause compliance with, and be liable for any person's violating or failing to comply with, any of:
 - a. The applicable objective site standards of §4-7-226.
 - b. The applicable obligatory site work practice standards of §4-7-230.
 - c. The requirement that a Site Permit be approved prior to any person engaging in earthmoving that will cause more than 0.1 acre of disturbed area.
 - d. The provisions of any Site Permit for the Site approved pursuant to §§4-7-238 or 4-7-242, including the requirements of the Dust Management Plan included within that permit.
- D. Affirmative Defense for Wind-Driven Opacity Violations
An Owner and/or Operator shall have an affirmative defense to any enforcement action for opacity violations resulting solely from wind acting upon a stabilized surface, provided that:
1. The Owner and/or Operator can show that the prevailing wind speed exceeded 25 m.p.h. when averaged over one hour, as measured by:
 - a. A Pinal County Air Quality monitoring station in the affected area;
 - b. Any other certified meteorological station in the affected area; or
 - c. A wind-speed instrument calibrated to the manufacturer's standards and operated on-site.
 2. The Owner and/or Operator can show through written records or otherwise that:
 - a. The requirements of the Site dust control plan were being met; and
 - b. The offending areas of the Site were maintained in a condition adequate to meet relevant stabilization requirements under §§4-7-226.C and 4-7-226.D.
 3. The Owner and/or Operator can show that for any areas subject to any Development Activity that continues during windy conditions, including but not limited to earthmoving, equipment movement or site traffic, in addition to any other required control measures one or more of the following measures were applied and maintained:
 - a. All Development Activity, other than continued application of water for dust suppression and site stabilization purposes, has ceased;
 - b. Apply water or other suitable dust suppressant at least twice per hour to affected areas;
 - c. For areas that are shown to have an optimum moisture content of less than 12%, as determined by ASTM Method D1557-02e1 or other equivalent methods approved by the Control Officer and the Administrator, maintain at least 70% of the optimum soil moisture content, as determined by ASTM Method D2216-05 or other equivalent methods approved by the Control Officer and the Administrator;
 - d. For areas where the optimum moisture content has not been shown to be less than 12%, maintain soil moisture content at a minimum of 12%, as determined by ASTM Method D2216-05 or other equivalent methods approved by the Control Officer and the Administrator.
 4. The Owner and/or Operator can show that for temporary disturbed surfaces, including but not limited to, after work hours, weekends and holidays, in addition to any other required control measures, the following measures were applied as appropriate:
 - a. For open storage piles, either:
 - i. Apply water on all open storage piles at least twice per hour; or
 - ii. Cover open storage piles with tarps, plastic, or other material such that the wind will not remove the covering(s).
 - b. For other temporary disturbed surfaces, either:
 - i. Uniformly apply and maintain surface gravel or dust suppressants; or
 - ii. Apply water to disturbed surface areas at least three times per day, but if disturbed surface areas continue to show evidence of wind-blown dust, increase watering frequency to four times per day.

4-7-226. Objective Standards; Sites [New]

- A. Opacity Limitations. Opacity directly attributable to Development Activity or resulting from any disturbed areas caused by Development Activity shall not exceed any of the following limitations:

1. 0% Property Line Opacity Limitation. Subject to the exemptions below, the net opacity contribution from any Development Activity or disturbed areas caused by Development Activity shall not violate a 0% opacity standard at the boundary of the parcel for more than 30 seconds in any continuous six-minute period.
 - a. This limitation shall not apply to earthmoving operations conducted within 25 feet of a parcel boundary.
 - b. For purposes of this property line opacity standard, opacity shall be determined based on a time-aggregation method. See Article 9, §4-9-340.F.
 2. [Continuous Plume Limitation] Opacity shall not exceed 20% opacity for any continuous plume, as assessed by a time-averaging method, based on observations every 15 seconds over a 3-minute span, as defined in Article 9, §4-9-340.E.
 3. [Intermittent Plume Limitation] Opacity shall not exceed 20% opacity for any intermittent plume, as assessed by the average of a set of six paired observations, spaced by five seconds and conducted within a one-hour period, as defined by the appropriate test method in Article 9, see §§4-9-340.C and 4-9-340.D.
 4. [Wind Events] The opacity limitations of this rule shall apply to wind-driven emissions, provided that an Owner and/or Operator may have an affirmative defense to any violation upon making a showing as required under §4-7-222.
- B. Trackout Limitations.
1. [Basic Limitation] Continuous visible trackout from any Site onto a paved public roadway shall not exceed 25' in length or exhibit a trackout pack-depth greater than 0.25".
 2. On-site Trackout Control System. For any period of time when a project has more than two acres of area disturbed, or on any day that more than 100 cubic yards of bulk material is shipping in or out of the Site, install and maintain a trackout control system that prevents trackout.
 3. Trackout Control System Options.
Where a trackout control system is required, install and maintain at least one of the following system options.
 - a. Presumptively acceptable systems.
The following systems shall be acceptable options in a dust mitigation plan:
 - i. Rumble strips - 25 foot length. For use of grizzlies or other similar devices designed to remove dirt/mud from tires, the devices shall extend from the intersection with the public paved road surface for a distance of at least 25 feet, and cover the full width of the unpaved exit surface for at least 25 feet.
 - ii. Gravel pads - 50 foot length. For use of gravel pads, coverage with gravel shall be at least one inch or larger in diameter and at least 3 inches deep, shall extend from the intersection with the public paved road surface for a distance of at least 50 feet, and cover the full width of the unpaved exit surface for at least 50 feet. Any gravel deposited onto a public paved road travel lane or shoulder must be removed at the end of the workday or immediately following the last vehicle using the gravel pad, or at least once every 24 hours, whichever occurs first.
 - iii. Internal paving - 100 feet. For use of paving, paved surfaces shall extend from the intersection with the paved public road surface for a distance of at least 100 feet, and cover the full width of the unpaved access road for that distance to allow mud and dirt to drop off of vehicles before exiting the Site. Mud and dirt deposits accumulating on paved interior roads shall be removed with sufficient frequency, but not less frequently than once per workday, to prevent carryout and trackout onto a paved public road.
 - iv. [Wheel wash system] At all exits onto paved areas accessible to the public, install a wheel wash system.
- B. Alternative systems.
As an alternative, the Site Permit dust control plan may propose some other system for controlling trackout, provided that visible trackout from such system shall not exceed 5' in length onto a paved public road.
- C. Active Area Stabilization Requirements
1. Applicability; Affected Areas
Active area stabilization requirements apply to disturbed areas affected by on-site parking, vehicular traffic, equipment traffic, material transport, or equipment transport.
 2. [Objective Standards] Comply with each of the following requirements:
 - a. Every disturbed parking area and/or working area shall show compliance at all times with one of the following objective standards as assessed in accord with Article 9, §4-9-320.A:
 - i. Silt loading shall not exceed 0.33 oz/ft²; or
 - ii. Silt content shall not exceed 8% for parking and working areas.
 - b. Every disturbed roadway area shall show compliance at all times with one of the following objective standards as assessed in accord with Article 9, §4-9-320.A:
 - i. Silt loading shall not exceed 0.33 oz/ft²; or
 - ii. Silt content shall not exceed 6% for roads.
 - c. All disturbed areas other than parking areas, working areas or roadway areas affected under this Active Area Stabilization requirement shall be stabilized such that every disturbed area shows compliance at all times with the drop ball test of Article 9, §4-9-320.B.1.

3. [Maintenance Obligation] Maintain active area stabilization to meet the foregoing standards until the activity ceases and the affected area of the Site has been stabilized to meet the post-operation stabilization standards of §4-7-226.D.
- D. Stabilization Requirement for Inactive and Post-operation Areas
Any disturbed surface area on which no activity is occurring shall meet at least one of the standards described below. If areas of the Site exhibit visibly distinguishable surface characteristics, each area shall be separately assessed for stability. Stability shall be assessed in accord with the appropriate test methods described in Article 9, §4-9-320.B. Failure to maintain a disturbed surface area on which no activity is occurring shall be considered in violation of this rule unless the area is maintained in a manner that meets at least one of the standards listed below, as applicable.
1. [Drop Ball Test] Maintain stabilization or a soil crust adequate to pass the drop ball test;
 2. [Maintain 100 cm/sec. threshold friction velocity] Maintain a threshold friction velocity (TFV) for disturbed surface areas corrected for non-erodible elements of 100 cm/second or higher;
 3. [Maintain 50% flat vegetative cover] Maintain a flat vegetative cover (i.e., attached (rooted) vegetation or unattached vegetative debris lying on the surface with a predominant horizontal orientation that is not subject to movement by wind) that is equal to at least 50%;
 4. [Maintain 30% standing vegetative cover] Maintain a standing vegetative cover (i.e., vegetation that is attached (rooted) with a predominant vertical orientation) that is equal to or greater than 30%;
 5. [Maintain 10% standing vegetative cover and 43 cm/sec. TFV] Maintain a standing vegetative cover (i.e., vegetation that is attached (rooted) with a predominant vertical orientation) that is equal to or greater than 10% and where the threshold friction velocity is equal to or greater than 43 cm/second when corrected for non-erodible elements;
 6. [Minimum non-erodible element cover] Maintain a percent cover that is equal to or greater than 10% for non-erodible elements as measured by the "rock test"; or
 7. [Implement an approved alternative] Comply with a standard of an alternative test method, upon obtaining the written approval from the Control Officer and the Administrator.
- E. Duration of Stabilization Obligation.
1. Unpermitted Sites. For any unpermitted Site, maintain the stabilization standards of §4-7-226.D until Development Activity is complete.
 2. Sites Subject to a Block Permit. For any unpermitted Site, maintain the stabilization standards of §4-7-226.D until Development Activity is complete.
 3. Other Permitted Sites. For any other Site subject to permit requirement, maintain the stabilization standards of §4-7-226.D until the Control Officer approves closure of the Site Permit under Rule §4-7-238.
- 4-7-230. Obligatory Work Practice Standards; Sites
- A. Project Access Control.
Define, clearly mark, and enforce ingress and egress points for traffic into and out of the Site.
- B. Dust Suppression for Inactive and Post-operation Areas and Roadways
For all inactive and post-operation-areas and -roadways within the Site:
1. Restrict access, and pave, apply gravel or apply a suitable dust suppressant other than water;
 2. Apply water and prevent access by fences, ditches, vegetation, berms, or other suitable barrier or means sufficient to prevent trespass as approved by the Control Officer; or
 3. Establish a vegetative cover in accord with §4-7-226.D.
- C. Bulk Material Stacking and Stockpiling Operations
1. At least one of the following control measures shall be implemented during bulk material stacking, loading and unloading operations:
 - a. Spray material with water, as necessary, prior to stacking, loading and unloading and/or while stacking, loading and unloading; or
 - b. Spray material with a dust suppressant other than water, as necessary, prior to stacking, loading, and unloading and/or while stacking, loading and unloading.
 2. When not conducting stacking, loading or unloading operations, implement at least one of the following control measures with respect to a stockpile:
 - a. Cover all open storage piles with a tarp, plastic, or other material to prevent wind from removing the covering(s)/such that the covering(s) will not be dislodged by the wind; or
 - b. Apply water to maintain a soil moisture content at a minimum of 12%, as determined by ASTM Method D2216-05 or other equivalent methods approved by the Control Officer and the Administrator. For areas that have an optimum moisture content of less than 12% as determined by ASTM Method D1557-02e1 or other equivalent methods approved by the Control Officer and the Administrator, maintain at least 70% of the optimum soil moisture content; or
 - c. Maintain a soil crust; or
 - d. Implement either of the control measures in preceding subsection .b or .c, and construct and maintain wind barriers, storage silos, or a three-sided enclosure with walls, whose length is no less than equal to the length of the pile, whose distance from the pile is not more than twice the height of the pile, whose height is equal to the pile height, and whose porosity is no more than 50%.
- D. Trackout; Monitoring and Cleanup.
1. Monitor trackout length at each egress point.

2. Immediately clean up any trackout that violates the length or pack-thickness limitations of §4-7-226.B.1.
 3. Remove all visible trackout at the close of each workday and/or each work shift.
- E. Signage
At any Site that is five acres or larger, erect a project information sign at the main entrance that is visible to the public or at each end of the road construction Site. The sign shall be a minimum of 24 inches tall by 30 inches wide, have a white background, and have the words "DUST CONTROL" shown in black block lettering which is at least four inches high, and shall contain the following information in legible fashion"
1. Project Name
 2. Name and phone number of person(s) responsible for conducting project
 3. Text stating: "Dust Complaints? Call Pinal County Air Quality Control District at (520) 866-6929."
- F. Training
1. Dust Coordinator
On any Site, or any contiguous combination of Sites under common control, having five acres or more of disturbed surface area subject to a Site Permit requirement, assure that at all times during earthmoving activity operations related to the purposes for which an Site Permit is required, have on-site at least one individual qualified under a Control-Officer-approved Dust Control Coordinator training program.
 2. Superintendent and Water Pull Drivers
Assure that the site superintendent or other designated on-site representative of the Site Permit holder, and any water truck or water pull driver maintaining surface stabilization shall have successfully completed a Control-Officer-approved Basic Dust Control Training Class.
- G. Conformance with Project Access Control.
Drivers, contractors, subcontractors, and materialmen shall utilize only the ingress and egress defined by the Owner and/or Operator.
- H. Dust Suppression for Active Working Areas, Parking Areas and Roadways
To manage dust from working areas, including disturbed areas affected by on-site parking, vehicular traffic, equipment traffic, material transport, or equipment transport and roadways, at least one of the following measures shall be implemented:
1. Apply water so that the surface is visibly moist;
 2. Apply and maintain a suitable dust suppressant other than water;
 3. Limit speed to 15 mph and traffic to no more than 20 trips/day, provided reliance on this measure requires that the Dust Management Plan include a traffic management plan that details how speed and daily trips will be limited;
 4. Apply gravel, recycled asphalt or other suitable material; or
 5. Pave.
- I. Dust Suppression During Bulk Excavation Operations
1. Pre-watering shall be applied before commencing earthmoving cut-operations; and
 2. Water shall be applied during activity as required to limit particulate emissions to avoid opacity limit violations.
- J. Project-internal Load Stabilization
Load stabilization shall be required during haulage of bulk excavated materials internally within a Site and not crossing a paved public road by implementing at least one of the following measures:
1. Limit speed to 15 miles per hour;
 2. Stabilize loads with water or a dust suppressant; or
 3. Cover the load with a tarp or other suitable dust and wind impermeable material.
- K. Roadway-Crossing Load-Stabilization
Load stabilization shall be required during haulage of bulk excavated materials across a paved public road, by implementing all of the following limitations:
1. Load all haul trucks such that the freeboard is not less than three inches;
 2. Load all haul trucks such that at no time shall the highest point of the bulk material be higher than the sides, front, and back of a cargo container area;
 3. Prevent spillage or loss of bulk material from holes or other openings in the cargo compartment's floor, sides, and/or tailgate(s); and
 4. When crossing and/or accessing a paved area accessible to the public, install, maintain, and use a suitable trackout control device that controls and prevents trackout and/or removes particulate matter from tires and the exterior surfaces of haul trucks and/or motor vehicles that traverse the Site.
- L. Demolition; Emission Mitigation
To the extent Development Activity includes demolition activities, implement all of the following measures:
1. Apply water to demolition debris immediately following demolition activity; and
 2. Apply water to all disturbed soil surfaces to establish a crust and to prevent wind erosion.
- M. Weed Abatement; Emission Mitigation
To the extent Earthmoving for a particular project includes weed abatement activity, implement all of the following control measures:
1. Before weed abatement by discing or blading occurs, apply water;
 2. While weed abatement by discing or blading is occurring, apply water; and

3. After weed abatement by discing or blading occurs, pave, apply gravel, apply water, apply a suitable dust suppressant other than water, or establish vegetative ground cover.
- N. Blasting; Emission Mitigation
All of the following control measures shall be implemented for blasting operations at a Site:
1. In wind gusts above 25 miles per hour, discontinue/cease blasting; and
 2. Pre-water and maintain surface soils in a stabilized condition where support equipment and vehicles will operate.
- O. Subcontractor Registration Verification
Assure that any subcontractors engaged in earthmoving activity on the Site have registered with Pinal County Air Quality as a subcontractor.
- 4-7-234. Nonattainment-Area Dust Permit Program; General Provisions [New]
- A. Permittee's Universal Obligations
A permittee under this Article shall be bound to comply with:
1. Applicable objective and work practice standards,
 2. The commitments in a dust control plan submitted in support of the application,
 3. The application acknowledgments required for a particular permit, and
 4. The obligations, standards, and commitments in a permit.
- B. Permit Types
1. Site Permits
 2. Nonattainment Area Block Permits
 3. Any Site subject to a permit requirement under this rule shall not require an additional registration under §4-3-080, the existing county-wide dust registration program.
- C. Application Review and Approval; Dust Control Plan Merger; Limited Effect of Approval
1. Following submittal of a complete application under this Article, including payment of any necessary fee, the Control Officer shall within 10 working days approve, disapprove, or conditionally approve the permit application, in accordance with the requirements of this Article.
 2. Upon approval of any permit under this Article, the provisions of any dust control plan submitted as part of the application shall be merged as part of the permit, and any commitments in the dust control plan shall constitute enforceable requirements under the permit.
 3. Approval of a permit under this Article shall not excuse, or act as a shield with respect to, a violation of any requirement or limitation under these rules, including the provisions of this Article.
- D. Fees
Issuance of every permit shall be subject to payment of a fee as specified in Appendix C.
1. Construction Permits shall be assessed a fee based on project area and the fee specified in earthmoving Category A.
 2. Block permits shall be assessed a fee based on Appendix C, earthmoving Category D.
 3. Permit transfers shall be approved without a fee.
 4. Permit revisions shall be assessed a fee based on the time required to process the revision application, with a minimum billing of one hour, and a maximum revision fee of \$1000.00.
 5. Late-filed applications are subject to the late filing fee specified in Appendix C.
 6. Fee waivers are not allowed.
- E. Permit Duration
All permits shall have a one-year permit term.
- F. Permit Revisions
A permittee may request revision of a permit or a transfer of the permit by filing an amended application. A transfer request shall bear the signatures of authorized representatives for both the transferor and the transferee, and shall further properly identify the transferee.
- G. Renewals
Should a construction project last longer than the term of a permit, the permittee shall re-apply for a Dust Control Permit at least 14 calendar days prior to the expiration date of the original permit term. For good cause show, the Control Officer may extend that renewal application deadline. Provided the applicant has a rational system for the completion status of individual parcels within a project, a single permit renewal may cover derivative parcels even though they are no longer contiguous. The renewal fee shall be based on the un-completed area of the project.
- H. Right of entry and inspection.
Subject to the requirements of 49-471.03, any Site covered by a permit issued pursuant to this Article is subject to inspection without prior notice by the Control Officer.
- I. Application signatures.
Every application shall be signed by an individual, and that signature shall constitute a personal representation that the signer has authority to commit the named permit applicant ("Permittee") to comply with the provisions of this Article.

4-7-238. Nonattainment Area Site Permits [New]

- A. Applicability

1. Onset. Before Development Activity begins on a Site that will involve a disturbance of an aggregate area of more than 0.1 acres, the Owner and/or Operator or someone with privity to the Owner and/or Operator shall apply for and obtain a Site Permit from the Control Officer.
2. Duration/Termination. The Site Permit shall be maintained until all of the following occur:
 - a. Development Activity has ceased.
 - b. All disturbed portions of the Site have been stabilized.
 - c. Closure of the Site Permit in accord with this rule.

B. Application Requirements

A Site Permit application shall include each of:

1. Application coversheet
The applicant shall present an application on a form approved by the Control Officer, and shall include all essential identification information as specified on that form, including a proper legal identification of the applicant and the property owner, and the assessor's parcel number(s) for the project. A separate application is required for each Site location not contiguous to the location on the original application form.
2. Plot Plan or Site Plan
Each application shall include a plot plan with linear dimensions in feet. The plot plan must be on 8-1/2 by 11 inch paper, and may be on one or more sheets. The plan should identify the assessor's parcel number(s), the street address(es), the direction north, indicate the areas to be disturbed, and include a calculation of the area to be disturbed. The plan should show:
 - a. Entire project site/facility boundaries,
 - b. Acres to be disturbed with linear dimensions,
 - c. Nearest public roads,
 - d. North arrow, and
 - e. Planned exit locations onto paved areas accessible to the public.
3. Identification of surface-disturbing Activities
The Site Permit Application shall separately identify all activities that may cause a surface disturbance, specifically including planned earthmoving activities and other planned activities that may cause a disturbed surface.
 - a. Non-earthmoving Activities. The Site Permit application shall identify planned non-earthmoving activity, including any of:
 - i. Vehicle traffic
 - ii. Equipment traffic
 - iii. Parking
 - iv. Material storage and handling
 - v. Other activities.
 - b. Earthmoving Activities. The Site Permit application shall identify planned earthmoving activity, including any of:
 - i. Primary mass grading operations
 - ii. Excavations for new footings, pads and concrete work
 - iii. Grubbing existing foundations, slabs or structures
 - iv. Installation of underground utilities
 - v. Landscaping
 - vi. Other earthmoving activities as defined in §4-7-210.
4. Site Dust Control Plan.
The applicant shall include in the application a Site Dust Control Plan, explaining the mitigation measures that will be used to control dust from every covered activity to be conducted on the Site. To be approvable under §4-7-234.C, the Dust Control Plan must explain how the Permittee will achieve compliance with each relevant objective standard in §4-7-226 and each relevant work practice standard in §4-7-230. At a minimum, the Site Dust Control Plan must address each of the following issues, and for each of the controls required under subparagraphs a. through h., must both designate all required measures as primary control measures and must additionally designate at least one contingency control measure:
 - a. Indicate how access to the Site will be controlled.
 - b. Indicate whether the project will require a trackout control system. Whether or not a trackout control system is required, explain how trackout will be controlled at each of the access points.
 - c. For every identified earthmoving activity, explain how dust will be controlled by actions taken prior to or during that activity.
 - d. Apart from earthmoving, explain how the Permittee will establish and maintain stabilization of roadways, and areas used for traffic, parking, and the handling and storage of materials.
 - e. If the applicant proposes to achieve stabilization by limiting speeds and traffic volume, explain how those limits will be enforced.
 - f. Explain how, once earthmoving operations are completed, affected areas will be stabilized.
 - g. Explain how areas disturbed by non-earthmoving activities will be stabilized.
 - h. If stabilization will depend upon restricting access or preventing trespass, explain how that will be achieved.

- i. If dust mitigation efforts will involve use of dust suppressants, identify the product, include copies of MSDS sheets, and define in the plan details of the utilization in accord with the manufacturer's recommendations, including the method, frequency and intensity of application; the type, number and capacity of application equipment; and information on environmental impacts and approvals or certifications related to appropriate safe use for ground application.
 - j. Define how often records of the volume of water- or suppressant-usage will be recorded.
 - k. Define how frequently property-line opacity observations will be conducted and corresponding records recorded.
 - l. Define how frequently activity-linked opacity observations will be conducted and corresponding records recorded.
 - m. Define how frequently stabilization observations will be conducted and corresponding records recorded.
 - n. Define how frequently trackout inspections will be conducted and corresponding records recorded.
5. Phased Close-out Plan
A Site Permit applicant may propose, as an element of the Site Dust Control Plan, a tracking system to define which individual parcels within a PAD or subdivision have qualified for Permit Closeout with respect to that parcel. Subject to the approval of the Control Officer, the tracking system proposal may include an electronic spreadsheet and linked electronic map maintained at the PAD or subdivision site. Closeout with respect to any parcel cannot take effect before the Permittee provides notice to the Control Officer regarding
- C. Permittee's Obligations
1. Application Acknowledgments. By signing an application, the Permittee acknowledges obligations to, and liability for failure to:
 - a. Assure that any earthmoving activity on the Site is covered by the Permit;
 - b. With respect to the Site:
 - i. Comply with or cause compliance with objective standards of §4-7-226.
 - ii. Comply with or cause compliance with obligatory work practice standards of §4-7-230.
 - iii. Comply with or cause compliance with commitments in the dust management plan submitted in support of the Permit application.
 2. Permit must be available on-site. A complete copy of the Site Permit, including the dust control plan, shall be kept on the project at all times that Construction Activities occur and shall be made available upon request of the Control Officer.
 3. Recordkeeping. On any day when disturbed surfaces remain on the Site and any earthmoving or construction activity occurs, the Permittee shall maintain daily logs showing:
 - a. Records verifying integrity of entrance/exit definitions.
 - b. Records of trackout compliance inspections.
 - c. Water/suppressant truck hours of operation and water or suppressant application rates. Permittee may use whatever metrics will reasonably reflect actual application rates.
 - d. Records of opacity observations, including notation of methods utilized.
 - e. Records of location and results of surface stabilization assessments, including notation of methods utilized.
 - f. Compliance with the dust control plan.
 4. Basic Dust Control Training Requirement. No later than December 31, 2008, a site superintendent or other designated on-site representative of the permit holder and water truck and water pull drivers for each Site shall have successfully completed a Control-Officer-approved Basic Dust Control Training Class.
 5. Dust Control Coordinator Requirement. Any Site, or any contiguous combination of Sites under common control, having five acres or more of disturbed surface area subject to a Permit requirement shall, at all times during earthmoving activity operations related to the purposes for which a Site Permit is required, have on-site at least one individual qualified under a Control-Officer-approved Dust Control Coordinator training program.
- D. Permit Closeout
1. Site-wide Project Closure; Closure of the Obligations of the Owner and/or Operator.
An Owner and/or Operator may attain a project-wide closeout ("project closure") by obtaining from the Control Officer a written Approval of Certificate of Project Completion based upon a showing of final stabilization following completion of all Development Activity.
 2. Site-wide Project Closure; Closure of Permittee's Obligation.
A Permittee may terminate his liability under this Article by obtaining from the Control Officer a written Approval of Certificate of Project Completion, based upon the contractor's showing of:
 - a. Final stabilization following completion of contracted project-wide Development Activity;
 - b. Other equitable grounds (i.e. Termination of contractor's involvement with project).
 3. Phased Closure.
An Owner and/or Operator and a Permittee may terminate liability and obligation under this Article with respect to a specific lot or parcel within a development, by complying with the terms of a Control-Officer-approved phased closure plan.

4-7-242. Nonattainment Area Block Permits [New]

A. Applicability

1. Nonattainment Area Block Permits shall only be available for earthmoving activity associated with:
 - a. Maintenance of existing underground or above-ground lines;
 - b. Effecting end-user connections, including but not limited to water connections, sewer connections, natural gas connections, electrical power connections, and communications connections;
 - c. Underground utility line extensions not exceeding 500' in length; and
 - d. Overhead utility line extensions.
2. Nonattainment Area Block Permits shall only be available to:
 - a. Political subdivisions; and
 - b. Public Utility Corporations regulated by the Arizona Corporation Commission.

B. Application Requirements

A Nonattainment Area Block Permit application shall include each of:

1. Application coversheet
The applicant shall present an application on a form approved by the Control Officer, and shall include all identification information as specified on that form, including a proper legal identification of the applicant.
2. Plot Plan or Site Plan - Not required.
3. Identification of surface-disturbing activities
The Block Permit Application shall acknowledge that applicability is limited to installation of underground utilities and any associated landscaping.
4. Permit applicability form
Not required.
5. Block Permit dust control plan.
The applicant shall include in the application a Block Permit Dust Control Plan, explaining the mitigation measures that will be used to control dust from every covered activity to be conducted under the Block Permit. To be approvable under §4-7-234.C, the Block Permit Dust Control Plan must explain how the Permittee will achieve compliance with each relevant objective standard in §4-7-226 and each relevant work practice standard in §4-7-230. At a minimum, the Block Permit Dust Control Plan must address each of the following issues, and for each of the controls required under subparagraphs a. through h., must both designate all required measures as primary control measures and must additionally designate at least one contingency control measure:
 - a. Indicate how access to the Site will be controlled.
 - b. Indicate whether the project will require a trackout control system. Whether or not a trackout control system is required, explain how trackout will be controlled at each of the access points.
 - c. For every identified earthmoving activity, explain how dust will be controlled by actions taken prior to or during that activity.
 - d. Apart from earthmoving, explain how the Permittee will establish and maintain stabilization of roadways, and areas used for traffic, parking, and the handling and storage of materials.
 - e. If the applicant proposes to achieve stabilization by limiting speeds and traffic volume, explain how those limits will be enforced.
 - f. Explain how, once earthmoving operations are completed, affected areas will be stabilized.
 - g. Explain how areas disturbed by non-earthmoving activities will be stabilized.
 - h. If stabilization will depend upon restricting access or preventing trespass, explain how that will be achieved.
 - i. If dust mitigation efforts will involve use of dust suppressants, identify the product, include copies of MSDS sheets, and define in the plan details of the utilization in accord with the manufacturer's recommendations, including the method, frequency and intensity of application; the type, number and capacity of application equipment; and information on environmental impacts and approvals or certifications related to appropriate safe use for ground application.
 - j. Define how often records of the volume of water- or suppressant-usage will be recorded.
 - k. Define how frequently property-line opacity observations will be conducted and corresponding records recorded.
 - l. Define how frequently activity-linked opacity observations will be conducted and corresponding records recorded.
 - m. Define how frequently stabilization observations will be conducted and corresponding records recorded.
 - n. Define how frequently trackout inspections will be conducted and corresponding records recorded.

C. Block Permittee's Obligations

1. Application Acknowledgments. By signing an application, the Block Permittee acknowledges an obligation to:
 - a. Assure that any earthmoving activity on the Site conducted by the Permittee is covered by an Block Permit;
 - b. With respect to every Site:
 - i. Comply with objective standards of §4-7-226, including the post-operation stabilization requirement.

- ii. Comply with obligatory work practice standards of §4-7-230.
 - iii. Comply with commitments in the dust management plan submitted in support of the Block Permit application.
 2. The Block Permittee shall, for any project that will disturb more than 0.1 acres, provide the Control Officer with notice of the start and completion of each project conducted under the Block Permit. The notice shall be provided in a format approved by the Control Officer.
 3. Permit must be available on-site. For any project for which notification is required, a complete copy of the Block Permit, including the Block Permit Dust Control Plan, shall be available on every project Site at all times that earthmoving activities occur and made available upon request of the Control Officer.
 4. Permittee responsible for compliance. The permittee is responsible for ensuring that all Persons abide by the conditions of the Block Permit and these regulations such that the Site remains in compliance with the Block Permit.
 5. Recordkeeping
Unless an alternative frequency is presented in a dust control plan and approved in a permit, on any day when earthmoving activity occurs the Permittee shall maintain daily logs showing:
 - a. Water/suppressant truck hours of operation and water or suppressant application rates. Permittee may use whatever metrics reasonably reflect application rates.
 - b. Records of opacity observations, including notation of methods utilized.
 - c. Records of location and results of post-operation surface stabilization assessments, including notation of methods utilized.
 - d. Compliance with Block Permit dust control plan.
 6. Basic Dust Control Training Requirement. A site superintendent or other designated on-site representative of the Block Permit holder and water truck and water pull drivers for each Site that will involve disturbance of more than 0.1 acres shall have successfully completed a Control-Officer-approved Basic Dust Control Training Class.
- D. Permit Closeout
Not applicable.

4-7-246. Recordkeeping and Records Retention [New]

- A. Requirement to furnish records upon request. Upon verbal or written request by the Control Officer, the log or the records and supporting documentation required under this Article shall be provided as soon as possible but no later than 48 hours, excluding weekends. If the Control Officer is at the Site where requested records are kept, records shall be provided without delay.
- B. Records Retention. Any person subject to a record-keeping requirement shall retain copies of approved Dust Control Plans, control measures implementation records, and all supporting documentation for at least six months following the termination of the dust-generating operation and for at least two years from the date such records were initiated.

ARTICLE 9. TEST METHODS

4-9-320. Test Methods for Stabilization For Unpaved Roads and Unpaved Parking Lots [New]

- A. For Unpaved Roads and Unpaved Parking Lots
 1. Silt Content Test Method. The purpose of this test method is to estimate the silt content of the trafficked parts of unpaved roads and unpaved parking lots. The higher the silt content, the more fine dust particles that are released when cars and trucks drive on unpaved roads and unpaved parking lots.
 - a. Equipment:
 - i. A set of sieves with the following openings: 4 millimeters (mm), 2 mm, 1mm, 0.5 mm and 0.25 mm (or a set of standard/commonly available sieves), a lid, and a collector pan.
 - ii. A small whisk broom or paintbrush with stiff bristles and dustpan 1 ft. in width (The broom/brush should preferably have one, thin row of bristles no longer than 1.5 inches in length).
 - iii. A spatula without holes.
 - iv. A small scale with half-ounce increments (e.g. postal/package scale).
 - v. A shallow, lightweight container (e.g. plastic storage container).
 - vi. A sturdy cardboard box or other rigid object with a level surface.
 - vii. A basic calculator.
 - viii. Cloth gloves (optional for handling metal sieves on hot, sunny days).
 - ix. Sealable plastic bags (if sending samples to a laboratory).
 - x. A pencil/pen and paper.
 - b. Step 1 [-Test Site Selection; Sample Collection]: Look for a routinely traveled surface, as evidenced by tire tracks. [Only collect samples from surfaces that are not damp due to precipitation or dew. This statement is not meant to be a standard in itself for dampness where watering is being used as a control measure. It is only intended to ensure that surface testing is done in a representative manner.] Use caution when taking samples to ensure personal safety with respect to passing vehicles. Gently press the edge of a dustpan (1 foot in width) into the surface four times to mark an area that is 1 square foot. Collect a sample of loose surface material using a whiskbroom or brush

and slowly sweep the material into the dustpan, minimizing escape of dust particles. Use a spatula to lift heavier elements such as gravel. Only collect dirt/gravel to an approximate depth of 3/8 inch or 1 cm in the 1 square foot area. If you reach a hard, underlying subsurface that is < 3/8 inch in depth, do not continue collecting the sample by digging into the hard surface. In other words, you are only collecting a surface sample of loose material down to 1 cm. In order to confirm that samples are collected to 1 cm in depth, a wooden dowel or other similar narrow object at least one foot in length can be laid horizontally across the survey area while a metric ruler is held perpendicular to the dowel.

- At this point, you can choose to place the sample collected into a plastic bag or container and take it to an independent laboratory for silt content analysis. A reference to the procedure the laboratory is required to follow is at the end of this section.

- c. Step 2 [- *Sample Weighing*]: Place a scale on a level surface. Place a lightweight container on the scale. Zero the scale with the weight of the empty container on it. Transfer the entire sample collected in the dustpan to the container, minimizing escape of dust particles. Weigh the sample and record its weight.
- d. Step 3 [- *Equipment Configuration*]: Stack a set of sieves in order according to the size openings specified above, beginning with the largest size opening (4 mm) at the top. Place a collector pan underneath the bottom (0.25 mm) sieve.
- e. Step 4 [- *Sample Processing #1*]: Carefully pour the sample into the sieve stack, minimizing escape of dust particles by slowly brushing material into the stack with a whiskbroom or brush. (On windy days, use the trunk or door of a car as a wind barricade.) Cover the stack with a lid. Lift up the sieve stack and shake it vigorously up, down and sideways for at least 1 minute.
- f. Step 5 [- *Sample Processing #2*]: Remove the lid from the stack and disassemble each sieve separately, beginning with the top sieve. As you remove each sieve, examine it to make sure that all of the material has been sifted to the finest sieve through which it can pass (e.g., material in each sieve [besides the top sieve that captures a range of larger elements] should look the same size). If this is not the case, re-stack the sieves and collector pan, cover the stack with the lid, and shake it again for at least 1 minute. (You only need to reassemble the sieve(s) that contain material, which requires further sifting.)
- g. Step 6 [- *Weighing Collector Pan Material*]: After disassembling the sieves and collector pan, slowly sweep the material from the collector pan into the empty container originally used to collect and weigh the entire sample. Take care to minimize escape of dust particles. You do not need to do anything with material captured in the sieves; only the collector pan. Weigh the container with the material from the collector pan and record its weight.
- h. Step 7 [- *Silt Loading and Silt Content Calculation*]: If the source is an unpaved road, multiply the resulting weight by 0.38. If the source is an unpaved parking lot, multiply the resulting weight by 0.55. The resulting number is the estimated silt loading. Then, divide by the total weight of the sample you recorded earlier in Step 2 and multiply by 100 to estimate the percent silt content.
- i. Step 8 [- *Characterization Across Entire Site*]: Select another two routinely traveled portions of the unpaved road or unpaved parking lot and repeat this test method. Once you have calculated the silt loading and percent silt content of the 3 samples collected, average your results together.
- j. Step 9: Examine Results. If the average silt loading is less than 0.33 oz/ft², the surface is STABLE. If the average silt loading is greater than or equal to 0.33 oz/ft², then proceed to examine the average percent silt content. If the source is an unpaved road and the average percent silt content is 6% or less, the surface is STABLE. If the source is an unpaved parking lot and the average percent silt content is 8% or less, the surface is STABLE. If your field test results are within 2% of the standard (for example, 4%–8% silt content on an unpaved road), it is recommended that you collect 3 additional samples from the source according to Step 1 and take them to an independent laboratory for silt content analysis.
- k. Independent Laboratory Analysis: You may choose to collect 3 samples from the source, according to Step 1 and send them to an independent laboratory for silt content analysis rather than conduct the sieve field procedure. If so, the test method the laboratory is required to use is:
 - U.S. Environmental Protection Agency (1995), “Procedures for Laboratory Analysis of Surface/Bulk Dust Loading Samples”, (AP-42 Fifth Edition, Volume I, Appendix C.2.3 “Silt Analysis”), Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

B. Stabilization Limitations for Open Areas and Vacant Lots: The test methods described below shall be used to determine whether an open area or a vacant lot has a stabilized surface. Should a disturbed open area or vacant lot contain more than one type of disturbance, soil, vegetation, or other characteristics, which are visibly distinguishable, test each representative surface separately for stability, in an area that represents a random portion of the overall disturbed conditions of the site, according to the appropriate test methods described below, and include or eliminate it from the total size assessment of disturbed surface area(s) depending upon test method results.

1. Visible Crust Determination [- *The "Drop Ball Test"*].
 - a. [*Appropriate Testing Conditions*] Where a visible crust exists, drop a steel ball with a diameter of 15.9 millimeters (0.625 inches) and a mass ranging from 16-17 grams (0.56-0.60 ounce) from a

distance of **30 centimeters** (one foot) directly above (at a 90° angle perpendicular to) the soil surface. If blowsand is present, clear the blowsand from the surfaces on which Drop Ball Test is conducted. Blowsand is defined as thin deposits of loose uncombined grains covering less than 50% of a vacant lot which have not originated from the representative vacant lot surface being tested. If material covers a visible crust, which is not blowsand, apply the Threshold Friction Velocity determination of §B.2 of this rule to the loose material to determine whether the surface is stabilized.

- b. *[Definition of Sufficient Crust]* A sufficient crust is defined under the following conditions: once a ball has been dropped according to the Appropriate Testing Conditions of §B.1.a, the ball does not sink into the surface, so that it is partially or fully surrounded by loose grains and, upon removing the ball, the surface upon which it fell has not been pulverized, so that loose grains are visible.
 - c. *[Characterization of Crust Across Entire Site]* Drop the ball three times within a survey area that measures 1 foot by 1 foot and that represents a random portion of the overall disturbed conditions at the site. The survey area shall be considered to have passed the Visible Crust Determination Test if at least two out of the three times that the ball was dropped, the results met the Definition of Sufficient Crust in §B.1.b. Select at least two other survey areas that represent a random portion of the overall disturbed conditions of the site, and repeat this procedure. If the results meet the Definition of Sufficient Crust in §B.1.b for all of the survey areas tested, then the site shall be considered to have passed the Visible Crust Determination Test and shall be considered sufficiently crusted.
 - d. *[Characterization of Crust Across Entire Site]* At any given site, the existence of a sufficient crust covering one portion of the site may not represent the existence or protectiveness of a crust on another portion of the site. Repeat the visible crust test as often as necessary on each random portion of the overall conditions of the site for an accurate measurement.
2. Determination of Threshold Friction Velocity (TFV): For disturbed surface areas that are not crusted or vegetated, determine threshold friction velocity (TFV) according to the following sieving field procedure (based on a 1952 laboratory procedure published by W. S. Chepil).
- a. *[Equipment & Procedure]* Obtain and stack a set of sieves with the following openings: 4 millimeters (mm), 2 mm, 1 mm, 0.5 mm, and 0.25 mm or obtain and stack a set of standard/commonly available sieves. Place the sieves in order according to size openings, beginning with the largest size opening at the top. Place a collector pan underneath the bottom (0.25 mm) sieve. Collect a sample of loose surface material from an area at least 30 cm by 30 cm in size to a depth of approximately 1 cm using a brush and dustpan or other similar device. Only collect soil samples from dry surfaces (i.e. when the surface is not damp to the touch). Remove any rocks larger than 1 cm in diameter from the sample. Pour the sample into the top sieve (4 mm opening) and cover the sieve/collector pan unit with a lid. Minimize escape of particles into the air when transferring surface soil into the sieve/collector pan unit. Move the covered sieve/collector pan unit by hand using a broad, circular arm motion in the horizontal plane. Complete twenty circular arm movements, ten clockwise and ten counter-clockwise, at a speed just necessary to achieve some relative horizontal motion between the sieves and the particles. Remove the lid from the sieve/collector pan unit and disassemble each sieve separately beginning with the largest sieve. As each sieve is removed, examine it for loose particles. If loose particles have not been sifted to the finest sieve through which they can pass, reassemble and cover the sieve/collector pan unit and gently rotate it an additional ten times. After disassembling the sieve/collector pan unit, slightly tilt and gently tap each sieve and the collector pan so that material aligns along one side. In doing so, minimize escape of particles into the air. Line up the sieves and collector pan in a row and visibly inspect the relative quantities of catch in order to determine which sieve (or whether the collector pan) contains the greatest volume of material. If a visual determination of relative volumes of catch among sieves is difficult, use a graduated cylinder to measure the volume. Estimate TFV for the sieve catch with the greatest volume using Table 1, which provides a correlation between sieve opening size and TFV.

Table 1. Determination of Threshold Friction Velocity

Tyler Sieve No.	ASTM I1 Sieve No.	Opening (mm)	TFV (cm/s)
5	5	5	135
9	10	2	100
16	18	1	76
32	35	0.5	58
60	60	0.25	43
Collector Pan	-	-	30

- b. *[Characterization of TFV Across Entire Site]* Collect at least three soil samples which represent random portions of the over-all conditions of the site, repeat the above TFV test method for each

sample and average the resulting TFVs together to determine the TFV uncorrected for non-erodible elements. Non-erodible elements are distinct elements, in the random portion of the overall conditions of the site, that are larger than 1 cm in diameter, remain firmly in place during a wind episode, and inhibit soil loss by consuming part of the shear stress of the wind. Non-erodible elements include stones and bulk surface material but do not include flat or standing vegetation. For surfaces with non-erodible elements, determine corrections to the TFV by identifying the fraction of the survey area, as viewed from directly overhead, that is occupied by non-erodible elements using the following procedure. For a more detailed description of this procedure, see §B.5 - the Rock Test Method. Select a survey area of 1 meter by 1 meter that represents a random portion of the overall conditions of the site. Where many non-erodible elements lie within the survey area, separate the non-erodible elements into groups according to size. For each group, calculate the overhead area for the non-erodible elements according to the following equations:

Average Length × Average Width = Average Dimensions Eq. 1

Average Dimensions × Number of Elements = Overhead Area Eq. 2

Overhead Area of Group 1 + Overhead Area of Group 2 (etc.) = Total Overhead Area Eq. 3

Total Overhead Area ÷ 2 = Total Frontal Area Eq. 4

(Total Frontal Area ÷ Survey Area) × 100 = Percent Cover of Non-Erodible Elements Eq. 5

Note: Ensure consistent units of measurement (e.g., square meters or square inches) when calculating percent cover.

Repeat this procedure on an additional two distinct survey areas that represent a random portion of the overall conditions of the site and average the results. Use Table 2 to identify the correction factor for the percent cover of non-erodible elements. Multiply the TFV by the corresponding correction factor to calculate the TFV corrected for non-erodible elements.

Table 2. Correction Factors for Threshold Friction Velocity

Percent Cover of Non-Erodible Elements Factor	Correction Factor
Greater than or equal to 10%	5
Greater than or equal to 5% and less than 10%	3
Less than 5% and greater than or equal to 1%	2
Less than 1%	None

3. Determination of Flat Vegetative Cover: Flat vegetation includes attached (rooted) vegetation or unattached vegetative debris lying on the surface with a predominant horizontal orientation that is not subject to movement by wind. Flat vegetation, which is dead but firmly attached, shall be considered equally protective as live vegetation. Stones or other aggregate larger than 1 centimeter in diameter shall be considered protective cover in the course of conducting the line transect test method. Where flat vegetation exists, conduct the following line transect test method.
 - a. Line Transect Test Method: Stretch a 100-foot measuring tape across a survey area that represents a random portion of the overall conditions of the site. Firmly anchor both ends of the measuring tape into the surface using a tool such as a screwdriver, with the tape stretched taut and close to the soil surface. If vegetation exists in regular rows, place the tape diagonally (at approximately a 45° angle) away from a parallel or perpendicular position to the vegetated rows. Pinpoint an area the size of a 3/32 inch diameter brazing rod or wooden dowel centered above each 1-foot interval mark along one edge of the tape. Count the number of times that flat vegetation lies directly underneath the pinpointed area at 1-foot intervals. Consistently observe the underlying surface from a 90° angle directly above each pinpoint on one side of the tape. Do not count the underlying surface as vegetated if any portion of the pinpoint extends beyond the edge of the vegetation underneath in any direction. If clumps of vegetation or vegetative debris lie underneath the pinpointed area, count the surface as vegetated, unless bare soil is visible directly below the pinpointed area. When 100 observations have been made, add together the number of times a surface was counted as vegetated. This total represents the percent of flat vegetation cover (e.g., if 35 positive counts were made, then vegetation cover is 35%). If the survey area that represents a random portion of the overall conditions of the site is too small for 100 observations, make as many observations as possible. Then multiply the count of vegetated surface areas by the appropriate conversion factor to obtain percent cover. For example, if vegetation was counted 20 times within a total of 50 observations, divide 20 by 50 and multiply by 100 to obtain a flat vegetation cover of 40%.
 - b. *[Required Number of Observations]* Conduct the line transect test method, as described above, an additional two times on areas that represent a random portion of the overall conditions of the site and average results.
4. Determination of Standing Vegetative Cover: Standing vegetation includes vegetation that is attached (rooted) with a predominant vertical orientation. Standing vegetation, which is dead but firmly rooted, shall

be considered equally protective as live vegetation. Conduct the following standing vegetation test method to determine if 30% cover or more exists. If the resulting percent cover is less than 30% but equal to or greater than 10%, then conduct the test in §B.2 (Determination of Threshold Friction Velocity [TFV]) in order to determine if the site is stabilized, such that the standing vegetation cover is equal to or greater than 10%, where threshold friction velocity, corrected for non-erodible elements, is equal to or greater than 43 cm/second.

- a. *[Define Survey Area]* For standing vegetation that consists of large, separate vegetative structures (e.g., shrubs and sagebrush), select a survey area that represents a random portion of the overall conditions of the site that is the shape of a square with sides equal to at least 10 times the average height of the vegetative structures. For smaller standing vegetation, select a survey area of three feet by three feet.
- b. *[Calculate Frontal Silhouette Area]* Count the number of standing vegetative structures within the survey area. Count vegetation, which grows in clumps as a single unit. Where different types of vegetation exist and/or vegetation of different height and width exists, separate the vegetative structures with similar dimensions into groups. Count the number of vegetative structures in each group within the survey area. Select an individual structure within each group that represents the average height and width of the vegetation in the group. If the structure is dense (e.g., when looking at it vertically from base to top there is little or zero open air space within its perimeter), calculate and record its frontal silhouette area, according to Equation 6. Also, use Equation 6 to estimate the average height and width of the vegetation if the survey area is larger than nine square feet. Otherwise, use the procedure in §B.4.c (Vegetative Density) to calculate the frontal silhouette area. Then calculate the percent cover of standing vegetation according to Equations 7, 8, and 9.

(Average Height) × (Average Width) = Frontal Silhouette Area Eq. 6

(Frontal Silhouette Area of Individual Vegetative Structure) × (Number of Vegetation Structures Per Group) = Frontal Silhouette Area of Group Eq. 7

Frontal Silhouette Area of Group 1 + Frontal Silhouette Area of Group 2 (etc.) = Total Frontal Silhouette Area. Eq. 8

(Total Frontal Silhouette Area ÷ Survey Area) × 100 = Percent Cover of Standing Vegetation Eq. 9

[(Number of Circled Gridlines within the Outlined Area Counted that are not Covered by Vegetation ÷ Total Number of Gridline Intersections within the Outlined Area) × 100] = Percent Open Space Eq. 10

100 – Percent Open Space = Percent Vegetative Density Eq. 11

Percent Vegetative Density ÷ 100 = Vegetative Density Eq. 12

[Max. Height × Max. Width] × [Vegetative Density/0.4]0.5 = Frontal Silhouette Area Eq. 13

Note: Ensure consistent units of measurement (e.g., square meters or square inches) when calculating percent cover.

- c. *Vegetative Density Factor:* Cut a single, representative piece of vegetation (or consolidated vegetative structure) to within 1 cm of surface soil. Using a white paper grid or transparent grid over white paper, lay the vegetation flat on top of the grid (but do not apply pressure to flatten the structure). Grid boxes of 1-inch or ½-inch squares are sufficient for most vegetation when conducting this procedure. Using a marker or pencil, outline the shape of the vegetation along its outer perimeter, according to Figure B, C, or D, as appropriate. (Note: Figure C differs from Figure D primarily in that the width of vegetation in Figure C is narrow at its base and gradually broadens to its tallest height. In Figure D, the width of the vegetation generally becomes narrower from its midpoint to its tallest height.) Remove the vegetation, count and record the total number of gridline intersections within the outlined area, but do not count gridline intersections that connect with the outlined shape. There must be at least 10 gridline intersections within the outlined area and preferably more than 20, otherwise, use smaller grid boxes. Draw small circles (no greater than a 3/32 inch diameter) at each gridline intersection counted within the outlined area. Replace the vegetation on the grid within its outlined shape. From a distance of approximately 2 feet directly above the grid, observe each circled gridline intersection. Count and record the number of circled gridline intersections that are not covered by any piece of the vegetation. To calculate percent vegetative density, use Equations 10 and 11. If percent vegetative density is equal to or greater than 30, use an equation (one of the Equations 16, 17, or 18) that matches the outline used to trace the vegetation (Figure B, C, or D) to calculate its frontal silhouette area. Outline the shape of the vegetation along its outer perimeter, as either a cylinder; an inverted cone; or the upper portion of a sphere, as appropriate. For classification purposes, vegetation that generally flares with increasing height should be considered an inverted cone. Vegetation that generally narrows in width above a midpoint should be considered as the upper portion of a sphere. If percent vegetative density is less than 30, use Equations 12 and 13 to calculate the frontal silhouette area.

Figure B. Cylinder - See MaricopaAppendixC (pdf, 2132 KB), page 10, available on-line at <http://yosemite.epa.gov/R9/r9sips.nsf/AgencyProvision/0A50F4E53BD113898825735B0065A8D6?OpenDocument>.

Frontal Silhouette Area = Maximum Height × Maximum Width Eq. 16

Figure C. Inverted Cone. See MaricopaAppendixC (pdf, 2132 KB), page 11, available on-line at <http://yosemite.epa.gov/R9/r9sips.nsf/AgencyProvision/0A50F4E53BD113898825735B0065A8D6?OpenDocument>.

Inverted Cone Frontal Silhouette Area = Maximum Height × ½ Maximum Width Eq. 17

Figure D. Upper Sphere. See MaricopaAppendixC (pdf, 2132 KB), page 12, available on-line at <http://yosemite.epa.gov/R9/r9sips.nsf/AgencyProvision/0A50F4E53BD113898825735B0065A8D6?OpenDocument>.

Upper Sphere - Frontal Silhouette Area = (3.14 × Maximum Height × ½ Maximum Width) ÷ 2 Eq. 18

5. Rock Test Method: The Rock Test Method examines the wind-resistance effects of rocks and other non-erodible elements on disturbed surfaces. Non-erodible elements are objects larger than 1 centimeter (cm) in diameter that remain firmly in place even on windy days. Typically, non-erodible elements include rocks, stones, glass fragments, and hard-packed clumps of soil lying on or embedded in the surface. Vegetation does not count as a non-erodible element in this method. The purpose of this test method is to estimate the percent cover of non-erodible elements on a given surface to see whether such elements take up enough space to offer protection against windblown dust. For simplification, the following test method refers to all non-erodible elements as “rocks”.

- a. *[Test Area]* Select a 1-meter × 1-meter survey area that represents the general rock distribution on the surface. (A 1-meter × 1-meter area is slightly greater than a 3-foot × 3-foot area.) Mark off the survey area by tracing a straight, visible line in the dirt along the edge of a measuring tape or by placing short ropes, yard sticks, or other straight objects in a square around the survey area.
- b. *[Initial Surface Characterization]* Without moving any of the rocks or other elements, examine the survey area. Since rocks >3/8 inch (1 cm) in diameter are of interest, measure the diameter of some of the smaller rocks to get a sense for which rocks need to be considered.
- c. *[Grouping Characterization of Rocks]* Mentally group the rocks >3/8 inch (1 cm) diameter lying in the survey area into small, medium, and large size categories. Or, if the rocks are all approximately the same size, simply select a rock of average size and typical shape. Without removing any of the rocks from the ground, count the number of rocks in the survey area in each group and write down the resulting number.
- d. *[Determination of Average Individual Rock Area]* Without removing rocks, select one or two average-size rocks in each group and measure the length and width. Use either metric units or standard units. Using a calculator, multiply the length times the width of the rocks to get the average dimensions of the rocks in each group. Write down the results for each rock group.
- e. *[Calculation of Aggregate Total Rock Area]* For each rock group, multiply the average dimensions (length times width) by the number of rocks counted in the group. Add the results from each rock group to get the total rock area within the survey area.
- f. *[Calculation of Total Rock Area]* Divide the total rock area by two (to get frontal area). Divide the resulting number by the size of the survey area (making sure the units of measurement match), and multiply by 100 for percent rock cover. For example, the total rock area is 1,400 square centimeters, divide 1,400 by 2 to get 700. Divide 700 by 10,000 (the survey area is 1 meter by 1 meter, which is 100 centimeters by 100 centimeters or 10,000 square centimeters), and multiply by 100. The result is 7% rock cover. If rock measurements are made in inches, convert the survey area from meters to inches (1 inch = 2.54 centimeters).
- g. *[Characterization of Rock Cover Across Entire Site]* Select and mark off two additional survey areas and repeat the procedures described above in subsections a. through f. Make sure the additional survey areas also represent the general rock distribution on the site. Average the percent cover results from all three survey areas to estimate the average percent of rock cover.
- h. *[Initial Rock Cover Stabilization Determination]* If the average rock cover is greater than or equal to 10%, the surface is stable. If the average rock cover is less than 10%, follow the procedures in the following subsection i.
- i. *[Combined Rock Cover/TFV Stabilization Determination]* If the average rock cover is less than 10%, the surface may or may not be stable. Follow the procedures in Subsection B.2 (Determination of Threshold Friction Velocity [TFV]) of this rule and use the results from the rock test method as a correction (i.e., multiplication) factor. If the rock cover is at least 1%, such rock cover helps to limit windblown dust. However, depending on the soil's ability to release fine dust particles into the air, the percent rock cover may or may not be sufficient enough to stabilize the surface. It is also possible that the soil itself has a high enough TFV to be stable without even accounting for rock cover.
- j. *[TFV Correction Based on Partial Rock Cover]* After completing the procedures to calculate the TFV as described in the preceding subsection, use Table 2 to identify the appropriate correction factor to the TFV, depending on the percent rock cover. Multiply the correction factor by the TFV value for a final TFV estimate that is corrected for non-erodible elements.

C. TEST METHODS ADOPTED BY REFERENCE: The following test methods are adopted by reference. These adoptions by reference include no future editions or amendments. Copies of the test methods listed in this section are available for review at Pinal County Air Quality, 31 North Pinal St., Florence, AZ 85232.

1. ASTM Method C136-06 (“Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates”), 2006 edition.
2. ASTM Method D2216-05 (“Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass”), 2005 edition.
3. ASTM Method D1557-02e1 (“Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))), 2002 edition.

4-9-340. Visual Opacity Test Methods

A. General Provisions

1. Applicability: These methods apply to the determination of opacity of visible emissions under this Chapter 4.
2. Principle: the opacity of emissions from sources of visible emissions is determined visually by an observer qualified according to the procedures of §G of this rule.
3. Procedures: An observer qualified, in accordance with §G of this rule shall use the procedures set forth in this Article for visually determining the opacity of emissions.

B. Procedures for Determining Opacity from Emissions From Stationary Sources

1. Opacity from stationary point sources shall be determined in accord with EPA Method 9, as adopted by reference herein.
2. Adoption by Reference
The following test methods are adopted by reference. These adoptions by reference include no future editions or amendments. Copies of the test methods listed in this section are available for review at Pinal County Air Quality, 31 North Pinal St., Florence, AZ 85232.

a. EPA Reference Method 9, 40 CFR Part 60, Appendix A (7/1/08).

C. Procedures for Determining Time-Averaged Opacity from Intermittent Operations

1. *[Applicability - Intermittent Plume Average Opacity Determination for Operations]*
The purpose of this method is determine the opacity of non-continuous dust plumes caused by activities including, but not limited to, bulk material loading/unloading, non-conveyorized screening, or trenching with backhoes.
2. Opacity Determination Process
 - a. Position: Stand at least 25 feet from the dust-generating operation in order to provide a clear view of the emissions with the sun oriented in the 140° sector to the back. Choose a discrete portion of the operation for observation, such as the unloading point, not the whole operation. Following the above requirements, make opacity observations so that the line of vision is approximately perpendicular to the dust plume and wind direction. If multiple plumes are involved, do not include more than one plume in the line of sight at one time.
 - b. Initial Fallout Zone: The initial fallout zone within the plume must be identified. Record the distance from the equipment or path that is your identified initial fallout zone. The initial fallout zone is that area where the heaviest particles drop out of the entrained fugitive dust plume. Opacity readings should be taken at the maximum point of the entrained fugitive dust plume that is located outside the initial fallout zone.
 - c. Field Records: Note the following on an observational record sheet:
 - i. Location of dust-generating operation, type of operation, type of equipment in use and activity, and method of control used, if any;
 - ii. Observer's name, certification data and affiliation, a sketch of the observer's position relative to the dust-generating operation, and observer's estimated distance and direction to the location of the dust-generating operation;
 - iii. Time that readings begin, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds); and
 - iv. Color of the plume and type of background.
 - d. Observations. Make opacity observations, to the extent possible, using a contrasting background that is perpendicular to the line of vision. Make two observations per discrete activity, beginning with the first reading at zero seconds and the second reading at five seconds. The zero-second observation should begin immediately after a plume has been created above the surface involved. Do not look continuously at the plume but, instead, observe the plume briefly at zero seconds and then again at five seconds.
 - e. Recording Observations: Record the opacity observations to the nearest 5% on an observational record sheet. Each momentary observation recorded represents the average opacity of emissions for a five-second period. Repeat observations until you have recorded at least a total of 12 consecutive opacity readings. The 12 consecutive readings must be taken within the same period of observation but must not exceed one hour. Observations immediately preceding and following interrupted observations can be considered consecutive (e.g., vehicle traveled in front of path, plume doubled over).

- f. Data Reduction: Average 12 consecutive opacity readings together. If the average opacity reading is equal to or less than the numerical standard in the underlying rule, the dust-generating operation is in compliance.
- D. *Procedures for Determining Average Opacity from Vehicle Movement*
- 1. *[Applicability - Intermittent Plume Average Opacity Determination for Vehicular Movement]*. The purpose of this test method is to estimate the percent opacity of fugitive dust plumes caused by vehicle movement on unpaved roads and unpaved parking lots. This method can only be conducted by an individual who has received certification as a qualified observer. Qualification and testing requirements can be found in Section G of this Rule.
 - 2. Opacity Determination Process
 - a. Step 1 *[- Position]*: Stand at least 16.5 feet from the fugitive dust source in order to provide a clear view of the emissions with the sun oriented in the 140° sector to the back. Following the above requirements, make opacity observations so that the line of vision is approximately perpendicular to the dust plume and wind direction. If multiple plumes are involved, do not include more than one plume in the line of sight at one time.
 - b. Step 2. *[- Field Records]*: Record the fugitive dust source location, source type, method of control used, if any, observer's name, certification data and affiliation, and a sketch of the observer's position relative to the fugitive dust source. Also, record the time, estimated distance to the fugitive dust source location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), observer's position to the fugitive dust source, and color of the plume and type of background on the visible emission observation from both when opacity readings are initiated and completed.
 - c. Step 3 *[- Observations]*: Make opacity observations, to the extent possible, using a contrasting background that is perpendicular to the line of vision. Make opacity observations approximately 1 meter above the surface from which the plume is generated. Note that the observation is to be made at only one visual point upon generation of a plume as opposed to visually tracking the entire length of a dust plume as it is created along a surface. Make two observations per vehicle, beginning with the first reading at zero seconds and the second reading at five seconds. The zero-second observation should begin immediately after the plume has been created above the surface involved. Do not look continuously at the plume but, instead, observe the plume briefly at zero seconds and then again at five seconds.
 - d. Step 4 *[- Recording Observations - #1]*: Record the opacity observations to the nearest 5% on an observational record sheet. Each momentary observation recorded represents the average opacity of emissions for a 5-second period. While it is not required by the test method, EPA recommends that the observer estimate the size of vehicles which generate dust plumes for which readings are taken (e.g. mid-size passenger car or heavy-duty truck) and the approximate speeds the vehicles are traveling when the readings are taken.
 - e. Step 5 *[- Recording Observations - #2]*: Repeat Step 3 and Step 4 until you have recorded a total of 12 consecutive opacity readings. This will occur once six vehicles have driven on the source in your line of observation for which you are able to take proper readings. The 12 consecutive readings must be taken within the same period of observation but must not exceed 1 hour. Observations immediately preceding and following interrupted observations can be considered consecutive.
 - f. Step 6 *[- Data Reduction]*: Average the 12 opacity readings together. If the average opacity reading is equal to or less than the numerical standard in the underlying rule, the source is in compliance.
- E. *Procedures for Determining Time-Averaged Opacity from Continuous Operations*
- 1. *[Applicability - Continuous Plume Average Opacity Determination for Operations]*

The purpose of this method is to determine the opacity of continuous dust plumes caused by equipment and activities including but not limited to graders, trenchers, paddlewheels, blades, clearing, leveling, and raking.
 - 2. Opacity Determination Process
 - a. Position: Stand at least 25 feet from the dust-generating operation to provide a clear view of the emissions with the sun oriented in the 140° sector to your back. Following the above requirements, make opacity observations so that the line of vision is approximately perpendicular to the dust plume and wind direction.
 - b. Dust Plume: Evaluate the dust plume generation and determine if the observations will be made from a single plume or from multiple related plumes.
 - i. If a single piece of equipment is observed working, then all measurements should be taken off the resultant plume as long as the equipment remains within the 140° sector to the back.
 - ii. If there are multiple related sources or multiple related points of emissions of dust from a particular activity, or multiple pieces of equipment operating in a confined area, opacity readings should be taken at the densest point within the discrete length of equipment travel path within the 140° sector to the back. Readings can be taken for more than one piece of equipment within the discrete length of travel path within the 140° sector to the back.

- c. Initial Fallout Zone: The initial fallout zone within the plume must be identified. Record the distance from the equipment or path that is your identified initial fallout zone. The initial fallout zone is that area where the heaviest particles drop out of the entrained fugitive dust plume. Opacity readings should be taken at the maximum point of the entrained fugitive dust plume that is located outside the initial fallout zone.
 - d. Field Records: Note the following on an observational record sheet:
 - i. Location of the dust-generating operation, type of operation, type of equipment in use and activity, and method of control used, if any;
 - ii. Observer's name, certification data and affiliation, a sketch of the observer's position relative to the dust-generating operation, and observer's estimated distance and direction to the location of the dust-generating operation; and
 - iii. Time that readings begin, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds).
 - e. Observations: Make opacity observations, to the extent possible, using a contrasting background that is perpendicular to the line of vision. Make opacity observations at a point beyond the fallout zone. The observations should be made at the densest point. Observations will be made every 10 seconds until at least 12 readings have been recorded. Do not look continuously at the plume, but observe the plume momentarily at 10-second intervals. If the equipment generating the plume travels outside the field of observation or if the equipment ceases to operate, mark an "X" for the 10-second reading interval. Mark an "X" when plumes are stacked or doubled, either behind or in front, or become parallel to line of sight. Opacity readings identified as "X" shall be considered interrupted readings.
 - f. Recording Observations: Record the opacity observations to the nearest 5% on an observational record sheet. Each momentary observation recorded represents the average opacity of emissions for a 10-second period.
 - g. Data Reduction: Average 12 consecutive opacity readings together. If the average opacity reading is equal to or less than the numerical standard in the underlying rule, the dust-generating operation is in compliance.
- F. Procedures for Determining the Frequency of Visible Emissions; Time Aggregation Method
- 1. *Applicability - Aggregate Quantification of Visible Emission Duration*
The purpose of this method is to determine the amount of time that visible emissions occur during the observation period (*i.e.*, the accumulated emission time).
 - 2. Adoption by Reference
The following test methods are adopted by reference. These adoptions by reference include no future editions or amendments. Copies of the test methods listed in this section are available for review at Pinal County Air Quality, 31 North Pinal St., Florence, AZ 85232.
 - a. EPA Reference Method 22 ("Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares"), 2000 edition.
- G. Qualification and Testing
- 1. Certification Requirements: To receive certification as a qualified observer, a candidate must be tested and demonstrate the ability to assign opacity readings in 5% increments to 25 different black plumes and 25 different white plumes, with an error not to exceed 15% opacity on any one reading and an average error not to exceed 7.5% opacity in each category. Candidates shall be tested according to the procedures described in this subsection. Any smoke generator shall be equipped with a smoke meter, which meets the requirements of this subsection. Certification tests that do not meet the requirements of this subsection are not valid. The certification shall be valid for a period of 6 months, and after each 6-month period the qualification procedures must be repeated by an observer in order to retain certification.
 - 2. Certification Procedure: The certification test consists of showing the candidate a complete run of 50 plumes, 25 black plumes and 25 white plumes, generated by a smoke generator. Plumes shall be presented in random order within each set of 25 black and 25 white plumes. The candidate assigns an opacity value to each plume and records the observation on a suitable form. At the completion of each run of 50 readings, the score of the candidate is determined. If a candidate fails to qualify, the complete run of 50 readings must be repeated in any retest. The smoke test may be administered as part of a smoke school or training program, and may be preceded by training or familiarization runs of the smoke generator, during which candidates are shown black and white plumes of known opacity.
 - 3. Smoke Generator Specifications: Any smoke generator used for the purpose of this subsection shall be equipped with a smoke meter installed to measure opacity across the diameter of the smoke generator stack. The smoke meter output shall display in-stack opacity, based upon a path length equal to the stack exit diameter on a full 0% to 100% chart recorder scale. The smoke meter optical design and performance shall meet the specifications shown in Table 3 of this appendix. The smoke meter shall be calibrated as prescribed in this subsection prior to conducting each smoke reading test. At the completion of each test, the zero and span drift shall be checked, and if the drift exceeds plus or minus 1% opacity, the condition shall be corrected prior to conducting any subsequent test runs. The smoke meter shall be demonstrated, at the time of installation, to meet the specifications listed in Table 3 of this appendix. This demonstration shall be

repeated following any subsequent repair or replacement of the photocell or associated electronic circuitry, including the chart recorder or output meter, or every 6 months, whichever occurs first.

- a. Calibration: The smoke meter is calibrated after allowing a minimum of 30 minutes warm-up by alternately producing simulated opacity of 0% and 100%. When stable response at 0% or 100% is noted, the smoke meter is adjusted to produce an output of 0% or 100%, as appropriate. This calibration shall be repeated until stable 0% and 100% readings are produced without adjustment. Simulated 0% and 100% opacity values may be produced by alternately switching the power to the light source on and off while the smoke generator is not producing smoke.
- b. Smoke Meter Evaluation: The smoke meter design and performance are to be evaluated as follows:
 - i. Light Source: Verify, from manufacturer's data and from voltage measurements made at the lamp, as installed, that the lamp is operated within plus or minus 5% of the nominal rated voltage.
 - ii. Spectral Response of Photocell: Verify from manufacturer's data that the photocell has a photopic response (i.e., the spectral sensitivity of the cell shall closely approximate the standard spectral-luminosity curve for photopic vision which is referenced in (b) of Table 3 of this appendix).
 - iii. Angle of View: Check construction geometry to ensure that the total angle of view of the smoke plume, as seen by the photocell, does not exceed 15°. Calculate the total angle of view as follows:
 Total Angle of View = $2 \tan^{-1} d/2L$
 where:
 d = The photocell diameter + the diameter of the limiting aperture; and
 L = The distance from the photocell to the limiting aperture.
 The limiting aperture is the point in the path between the photocell and the smoke plume where the angle of view is most restricted. In smoke generator smoke meters, this is normally an orifice plate.
 - iv. Angle of Projection: Check construction geometry to ensure that the total angle of projection of the lamp on the smoke plume does not exceed 15°. Calculate the total angle of projection as follows:
 Total Angle of Projection = $2 \tan^{-1} d/2L$
 Where:
 d = The sum of the length of the lamp filament + the diameter of the limiting aperture; and
 L = The distance from the lamp to the limiting aperture.
 - v. Calibration Error: Using neutral-density filters of known opacity, check the error between the actual response and the theoretical linear response of the smoke meter. This check is accomplished by first calibrating the smoke meter, according to subsection G.3.a , and then inserting a series of three neutral-density filters of nominal opacity of 20%, 50%, and 75% in the smoke meter path length. Use filters calibrated within plus or minus 2%. Care should be taken when inserting the filters to prevent stray light from affecting the meter. Make a total of five nonconsecutive readings for each filter. The maximum opacity error on any one reading shall be plus or minus 3%.
 - vi. Zero and Span Drift: Determine the zero and span drift by calibrating and operating the smoke generator in a normal manner over a 1-hour period. The drift is measured by checking the zero and span at the end of this period.
 - vii. Response Time: Determine the response time by producing the series of five simulated 0% and 100% opacity values and observing the time required to reach stable response. Opacity values of 0% and 100% may be simulated by alternately switching the power to the light source off and on while the smoke generator is not operating.

Table 3. Smoke Meter Design and Performance Specifications

Parameter	Specification
1. Light source	Incandescent lamp operated at nominal rated voltage
2. Spectral response of photocell	Photopic (daylight spectral response of the human eye)
Angle of view	5° maximum total angle
Angle of projection	5° maximum total angle
Calibration error	Plus or minus 3% opacity maximum
Zero and span drift	Plus or minus 1% opacity 30 minutes
3. Response time	Less than or equal to 5 seconds